Prepared expressly for THE WORLD BOOK ENCYCLOPEDIA

IRAN, AFGHANISTAN AND IRAQ

Maidani, Cape, Iran....I 9
Marun R., Iran.....F 4
Mashkel R., Iran.....H11
Mil Kuh (Mtn.), Afg...E10
Miyan Kaleh Peninsula, Iran.....C 6
Murdab (Bay), Iran...C 4
Murghab R., Afg.....D12
Naband, Cape, Iran...H 6
Namak-Sar, Lake, see Daryacheh-i-Namakzar
Oman, Gulf of, Iran....I 8
Paropamisus Range, Afg.....D12
Persepolis (Ruins), Iran.....G 6
Persian Gulf, Iran.....G 4
Puzim, Cape, Iran.....I10
Qais Isl., Iran.....H 6
Qara Chai R., Iran.....D 5
Qishm Isl., Iran.....H 7
Qizil Uzun R., Iran.....C 4
Qum R., Iran.....E 5
Rabch R., Iran.....I 9
Sefid R., Iran.....C 4
Shah Fuladi (Mtn.), Afg.....D13
Shahi (Isl.), Iran.....C 2
Shah R., Iran.....C 5
Shaikh Shu'aib (Isl.), Iran.....H 6
Shatt al 'Arab R., Iraq.....F 3
Shir Kuh (Mtn.), Iran.....F 7
Shur R., Iran.....D 5
Shur R., Iran.....F 7
Shur R., Iran.....F10
Shur R., Iran.....H 7
Siah Band (Mtn.), Afg.....E11
Sirri (Isl.), Iran.....I 7
Susa (Ruins), Iran.....E 3
Takht-i-Sulaiman (Mtn.), Iran.....C 5
Tank, Cape, Iran.....I 9
Tigris R., Iraq.....E 2
Tumurisk (San
Iran.....
Tunb (Isl.), Ira
Tuzlu (Lake), I
Urmia (Lake),
Ushturinan Kul
Iran.....
Zagros (Mts.),
Zaindeh R., Ira
Zardeh Kuh (M
Iran.....
Zuhreh R., Iran

portant part of Iranian life. His capital, Isfahan, was known in his day as the most beautiful city in the world. Safawid rule ended with the reign of Nadir Shah in the 1700's. Nadir Shah was the last Iranian conqueror. His forces overran Turkey and northern India. After his death, the Kajars became the rulers.

The Modern Period. The 1800's and 1900's were a period of increasing advances by the countries of Western Europe. The British conquered India, and wanted to gain control of Iran and Iraq as protection against the growing power of Russia. But the Russians took over the whole foreign trade of Iran with the Treaty of Turkmanchai in 1828. Russia gradually took possession of the northern districts of Iran. The opening of the Suez Canal made Iran more important than ever to Britain. In 1907 the Russians and British agreed to divide Iran into two "spheres of influence" for trade.

Meanwhile foreign merchants and missionaries were bringing Western ideas into Iran. The Iranians wanted a constitutional government like that of Great Britain. In 1906 the Shah granted the people a constitution which provided the representative form of government which Iran still has. But the king continued to hold the real power. The Kajar Shahs, who were gradually losing their power, tried to play off Russia against Britain. When Germany began its career of conquest, they tried to play off both Russia and Britain against Germany. The discovery of oil in 1908 made Iran still more important to other countries.

During World War I, battles between Turkey and the Allies took place in Iran. The Germans tried to stir up the Iranians against Russia and England, but failed. Iran had a period of freedom from Russian pressure after the war. The Soviet Government was having trouble with outside interference in its own country, and withdrew its forces from Iran. For this reason, Iran took advantage of the Russian withdrawal to demand better terms from Great Britain for British use of Iranian oil. British interests gradually took control of Iran. But in a few years a new king, Riza Khan, rose to power in Iran and began to enforce a policy of Iran for the Iranians.

Riza Khan was an army officer. He organized his troops so well that he soon had the whole country under his control. The Iranians deposed the last Kajar Shah and set up Riza as the new Shah in 1925. Riza created a fine army by drafting men, established a civil service, and appointed all the higher officials himself. Roads and railways were built.

Iran announced its neutrality when World War II broke out, and tried to maintain that neutrality. But the Allies needed Iran's oil, and its new railway, which was almost the only possible way to send supplies into the Soviet Union. The Allies invaded Iran and forced Riza Shah to abdicate. His son, Mohammed, became Shah. Iran became one of the United Nations, and declared war on the Axis countries. Riza was taken to the British island of Mauritius, and later to South Africa, where he died in 1944.

After the war, British and American troops were withdrawn, but the Soviet Union refused to withdraw its forces until Iran signed an agreement to permit Russian development of the oil resources in the northwestern province of Azerbaijan. Iran appe United Nations, accusing the Soviet Union revolution in the province. On order of t Nations, all Soviet troops were withdrawn by early May, 1946.

However, extreme nationalist groups, an outlawed Tudeh, or Communist, party pro tilities against Great Britain and other Weste Neither large sums of American money rece the U.S. Point Four program, nor the fact tha split up his estates to be sold as farms to the satisfied these groups. They committed vari violence, and even threatened to kill the Sh if he did not carry out their anti-Western 1951, the Madjlis (Parliament) voted to natio British-owned oil industry of Iran. The main was that Iran's share in the profits was too s British were unable to arrange a compromis property of the Anglo-Iranian Oil Company over by the Iranian Government. British t and employees were ordered to leave the Iranians were not capable of operating the themselves. Thousands of Iranian workers jobs, and the country suffered tremendous losses.

Related Subjects. The reader is also referred

BIOGRAPHY AND HISTORY

Aryan
Cambyses II
Cyrus the Great
Cyrus the Younger
Darius
Firdausi
Greece (The Period of Glory)
Hafiz
Marathon
Media
Omar Kha
Riza Shah
Saadi
Xerxes
Zoroaster

UNCLASSIFIED

Caspian Sea
Chess (History)
Dress (Dress of Ancient Times [Persia]; color plate, Costumes of Ancient Peoples)
Elburz, or Elbruz Mountains
Flag (color plate, Flags of Asia)
Khan
Kurdista
Moslem
Persian C
Petroleu
Rugs an
Tehran

Questions

Why is Iran connected with the tales of the A Nights?

What is the meaning of the name *Iran?*

What were some of the developments of ea lization in Iran?

Why does Iran have no important rivers?

Where in Iran is the only place that trees

Why are few crops raised in Iran even thou soil is good?

What resource of Iran is greatly desired b countries?

In what part of Iran do the nomads live?

How did styles in clothing change during the in Iran? What caused the change?

What is meant by each of these: (a) *mull bazaar*, (c) *arrack?*

How does an Iranian boy learn a craft? H crafts being encouraged today?

What are Iran's chief exports? Chief imp

Why has it been difficult to develop transpo in Iran?

How long may it take to make a Persian rug

Why have recent rulers encouraged games in

What part did Iran play in World War II?

IRAN, AFGHANISTAN AND IRAQ

Maidani, Cape, Iran....I 9
Marun R., Iran.....F 4
Mashkel R., Iran.....H11
Mil Kuh (Mtn.), Afg...E10
Miyan Kaleh Peninsula, Iran.....C 6
Murdab (Bay), Iran....C 4
Murghab R., Afg.....D12
Naband, Cape, Iran...H 6
Namak-Sar, Lake, see Daryacheh-i-Namakzar
Oman, Gulf of, Iran....I 8
Paropamisus Range, Afg.....D12
Persepolis (Ruins), Iran.....G 6
Persian Gulf, Iran.....G 4
Puzim, Cape, Iran.....I10
Qais Isl., Iran.....H 6
Qara Chai R., Iran.....D 5
Qishm Isl., Iran.....H 7
Qizil Uzun R., Iran.....C 4
Qum R., Iran.....E 5
Rabch R., Iran.....I 9
Sefid R., Iran.....C 4
Shah Fuladi (Mtn.), Afg.....D13
Shahi (Isl.), Iran.....C 2
Shah R., Iran.....C 5
Shaikh Shu'aib (Isl.), Iran.....H 6
Shatt al 'Arab R., Iraq.....F 3
Shir Kuh (Mtn.), Iran.....F 7
Shur R., Iran.....D 5
Shur R., Iran.....F 7
Shur R., Iran.....F10
Shur R., Iran.....H 7
Siah Band (Mtn.), Afg.....E11
Sirri (Isl.), Iran.....I 7
Susa (Ruins), Iran.....E 3
Takht-i-Sulaiman (Mtn.), Iran.....C 5
Tank, Cape, Iran.....I 9
Tigris R., Iraq.....E 2
Tumurisk (Sand), Iran.....D
Tunb (Isl.), Iran.....H
Tuzlu (Lake), Iran.....D
Urmia (Lake), Iran.....C
Ushturinan Kuh (Mtn.), Iran.....E
Zagros (Mts.), Iran.....E
Zaindeh R., Iran.....E
Zardeh Kuh (Mtn.), Iran.....E
Zuhreh R., Iran.....F

portant part of Iranian life. His capital, Isfahan, was known in his day as the most beautiful city in the world. Safawid rule ended with the reign of Nadir Shah in the 1700's. Nadir Shah was the last Iranian conqueror. His forces overran Turkey and northern India. After his death, the Kajars became the rulers.

The Modern Period. The 1800's and 1900's were a period of increasing advances by the countries of Western Europe. The British conquered India, and wanted to gain control of Iran and Iraq as protection against the growing power of Russia. But the Russians took over the whole foreign trade of Iran with the Treaty of Turkmanchai in 1828. Russia gradually took possession of the northern districts of Iran. The opening of the Suez Canal made Iran more important than ever to Britain. In 1907 the Russians and British agreed to divide Iran into two "spheres of influence" for trade.

Meanwhile foreign merchants and missionaries were bringing Western ideas into Iran. The Iranians wanted a constitutional government like that of Great Britain. In 1906 the Shah granted the people a constitution which provided the representative form of government which Iran still has. But the king continued to hold the real power. The Kajar Shahs, who were gradually losing their power, tried to play off Russia against Britain. When Germany began its career of conquest, they tried to play off both Russia and Britain against Germany. The discovery of oil in 1908 made Iran still more important to other countries.

During World War I, battles between Turkey and the Allies took place in Iran. The Germans tried to stir up the Iranians against Russia and England, but failed. Iran had a period of freedom from Russian pressure after the war. The Soviet Government was having trouble with outside interference in its own country, and withdrew its forces from Iran. For this reason, Iran took advantage of the Russian withdrawal to demand better terms from Great Britain for British use of Iranian oil. British interests gradually took control of Iran. But in a few years a new king, Riza Khan, rose to power in Iran and began to enforce a policy of Iran for the Iranians.

Riza Khan was an army officer. He organized his troops so well that he soon had the whole country under his control. The Iranians deposed the last Kajar Shah and set up Riza as the new Shah in 1925. Riza created a fine army by drafting men, established a civil service, and appointed all the higher officials himself. Roads and railways were built.

Iran announced its neutrality when World War II broke out, and tried to maintain that neutrality. But the Allies needed Iran's oil, and its new railway, which was almost the only possible way to send supplies into the Soviet Union. The Allies invaded Iran and forced Riza Shah to abdicate. His son, Mohammed, became Shah. Iran became one of the United Nations, and declared war on the Axis countries. Riza was taken to the British island of Mauritius, and later to South Africa, where he died in 1944.

After the war, British and American troops were withdrawn, but the Soviet Union refused to withdraw its forces until Iran signed an agreement to permit Russian development of the oil resources in the northwestern province of Azerbaijan. Iran appealed to the United Nations, accusing the Soviet Union of inciting revolution in the province. On order of the United Nations, all Soviet troops were withdrawn from Iran by early May, 1946.

However, extreme nationalist groups, and also the outlawed Tudeh, or Communist, party provoked hostilities against Great Britain and other Western Powers. Neither large sums of American money received under the U.S. Point Four program, nor the fact that the Shah split up his estates to be sold as farms to the peasants, satisfied these groups. They committed various acts of violence, and even threatened to kill the Shah himself if he did not carry out their anti-Western policy. In 1951, the Madjlis (Parliament) voted to nationalize the British-owned oil industry of Iran. The main complaint was that Iran's share in the profits was too small. The British were unable to arrange a compromise. All the property of the Anglo-Iranian Oil Company was taken over by the Iranian Government. British technicians and employees were ordered to leave the country. Iranians were not capable of operating the industry themselves. Thousands of Iranian workers lost their jobs, and the country suffered tremendous financial losses.

R.Pea.

Related Subjects. The reader is also referred to:

Biography and History

Aryan
Cambyses II
Cyrus the Great
Cyrus the Younger
Darius
Firdausi
Greece (The Period of Glory)
Hafiz
Marathon
Media
Omar Khayyám
Riza Shah Pahlavi
Saadi
Xerxes
Zoroaster

Unclassified

Caspian Sea
Chess (History)
Dress (Dress of Ancient Times [Persia]; color plate, Costumes of Ancient Peoples)
Elburz, or Elbruz Mountains
Flag (color plate, Flags of Asia)
Khan
Kurdistan
Moslem
Persian Gulf
Petroleum
Rugs and Carpets
Tehran

Questions

Why is Iran connected with the tales of the Arabian Nights?

What is the meaning of the name *Iran?*

What were some of the developments of early civilization in Iran?

Why does Iran have no important rivers?

Where in Iran is the only place that trees grow?

Why are few crops raised in Iran even though the soil is good?

What resource of Iran is greatly desired by other countries?

In what part of Iran do the nomads live?

How did styles in clothing change during the 1920's in Iran? What caused the change?

What is meant by each of these: (a) *mullah*, (b) *bazaar*, (c) *arrack?*

How does an Iranian boy learn a craft? How are crafts being encouraged today?

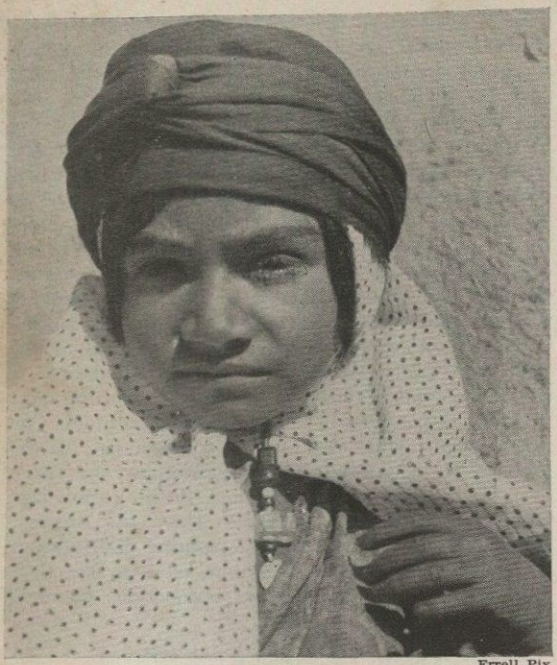
What are Iran's chief exports? Chief imports?

Why has it been difficult to develop transportation in Iran?

How long may it take to make a Persian rug?

Why have recent rulers encouraged games in Iran?

What part did Iran play in World War II?



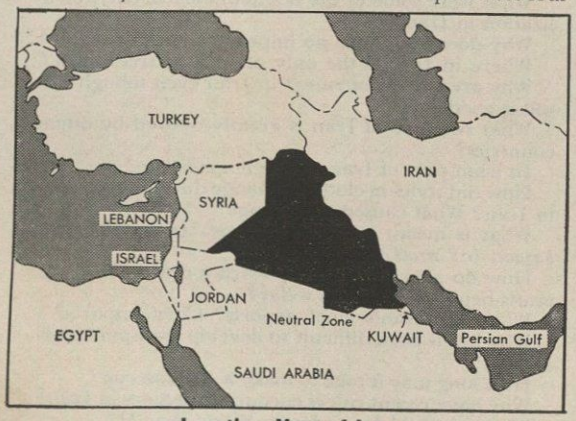
Errell, Pix

Bedouin Girl of Iraq. The beads at her neck are a charm intended to shield her from dangers and evil.

IRAQ, *e RAHK*, is a kingdom in southwestern Asia. It is a new nation in the old country that was called Mesopotamia. Iraq was formed from three provinces of the Turkish Empire (Mosul, Baghdad, and Basrah), at the end of World War I. This land was the home of the world's oldest known civilization. The people of Mesopotamia lived in villages, used pottery and bronze tools, and grew food crops at a time when Europeans were still savage hunters, wandering through the forests in search of wild game and berries and roots.

The early Mesopotamians invented important tools such as the wheel and the building arch. They were the first to divide the day into twenty-four hours. They used elaborate irrigation systems to water their fields. The region which became Iraq was far more prosperous in ancient times than it is today.

But Iraq still has valuable resources. It produces four fifths of the world's dates and is an important source of oil. Iraq's oil makes the country important to Great Britain, the United States, and the Soviet Union. Iraq is one of the important strongholds of the Moslem world. It has begun to develop itself as a modern nation and to identify its interests with those of its Arab neighbors.



Location Map of Iraq

Mesopotamia means *land between two rivers*. The richest, oldest, and most important part of Iraq lies in the valley formed by the Tigris and Euphrates rivers. The name *Iraq* means *department* in Arabic, for the three Iraq provinces once made up a department of the Turkish Empire.

The Land and Its Resources

Location, Size, and Surface Features. Iraq lies at the head of the Persian Gulf and forms the northeastern part of the Arabian peninsula. See ARABIA (colored map).

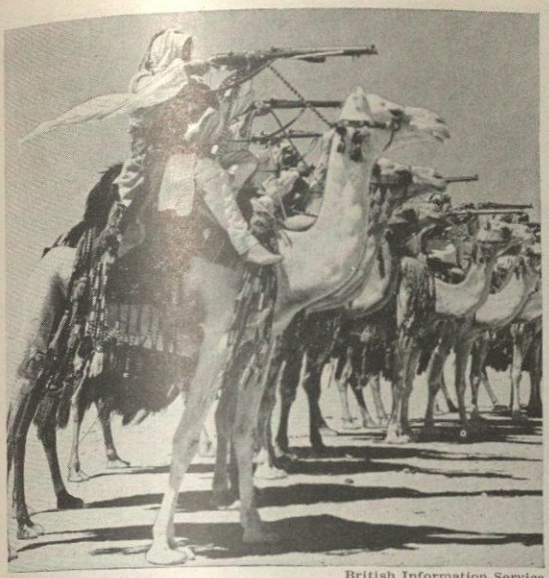
Iraq has an area of 168,243 square miles. It is a little larger than the state of California. Most of the country is flat, but the Zagros Mountains in the northeast part of the country rise to heights of over 12,000 feet above sea level.

There are four natural regions. *Lower Mesopotamia* is the southeastern part of the valley formed by the Euphrates and Tigris rivers. This region slopes from northwest to southeast and is only slightly above sea level. *Upper Mesopotamia* (formerly Assyria) is the part of the river valley which extends from Baghdad to the Syrian border. Upper Mesopotamia is a rolling, grassy plain. Northeast of the Tigris-Euphrates valley lies *Kurdistan* (the land of the Kurds), a wild, mountainous region. Kurdistan is part of the Iranian Plateau which stretches across northern Iraq. The *Arabian Desert* extends into Iraq in the western part of the country. Iraq is about one-twentieth desert, one-twentieth bush-forest, and nine-tenths dry plains, or steppes.

Sawders

Men of Iraq crossing the Euphrates River on ox-hides blown up with air. Rivers in Iraq were often crossed in this way before there were many boats or bridges.

Rivers. The Tigris and Euphrates rivers rise in the mountains of Turkey and flow from northwest to southeast through Iraq. (See EUPHRATES; TIGRIS RIVER.) They meet above Basra, and from that point to the Persian Gulf the stream is called the Shatt-al-Arab. The rivers are the life blood of the country. They give water for crops and make the soil rich. Both the ancient ruins and the modern cities of Iraq were built along the river banks. But in flood-time the rivers destroy crops, ruin houses,



British Information Service

Arabs of an Iraqi Camel Corps. They ride barefooted, and practice long hours to gain skill in firing from the saddle.

and leave swamps which are only wasteland. The Tigris is about 1,150 miles long. River steamboats sail up the Tigris as far as Baghdad. The Euphrates is a slow, winding river, 1,700 miles long. Only small river craft travel on the Euphrates because it is shallow.

Climate. Iraq is very hot in summer and quite cold in winter. The rainy season comes during the winter months, but little rain falls.

Natural Resources. The chief wealth of Iraq is its oil. Small deposits of other minerals include salt and poor-grade coal. The three chief oil fields are near the Persian border, in the northern Tigris Valley, and near the Euphrates River.

The discovery of oil in the 1920's was of great importance to Iraq. A foreign company controlled by Great Britain leased the oil rights. Pipe lines were built to carry the oil down to the sea. A railroad which had been planned before World War I was completed in 1940 because it was needed for transporting oil. Iraq now ranks seventh among the oil-producing countries of the world. There are four British-American oil companies operating in Iraq. The Iraqi government has a separate budget for spending the money it gets from the oil companies to develop the country's resources.

Iraq's second most important resource is its fine and dusty soil. The Tigris and Euphrates rivers have changed their courses many times and have deposited fertile soil throughout the valley. There is good grazing land in the mountain region and in the rolling north country. Iraq has almost no trees except in the mountain country of Kurdistan and along the rivers.

Irrigation of one sort or another is absolutely necessary to the life of Iraq. Some important irrigation projects have been built in modern Iraq. These include the Hindiya Barrage, or dam, which lifts the level of the Euphrates River and forces the water onto the plain, and the Habbaniya Escape, which releases the waters of the Euphrates so that they will not flood the farm lands. The Kut Barrage on the Tigris provides irrigation for some 900,000 acres of land through a canal called the Gharraf. Other irrigation projects have been planned by the government. In 1950, Iraq received $10,800,000 from the International Monetary Bank to build a flood-control dam on the Tigris at Tharthar.

The People and Their Work

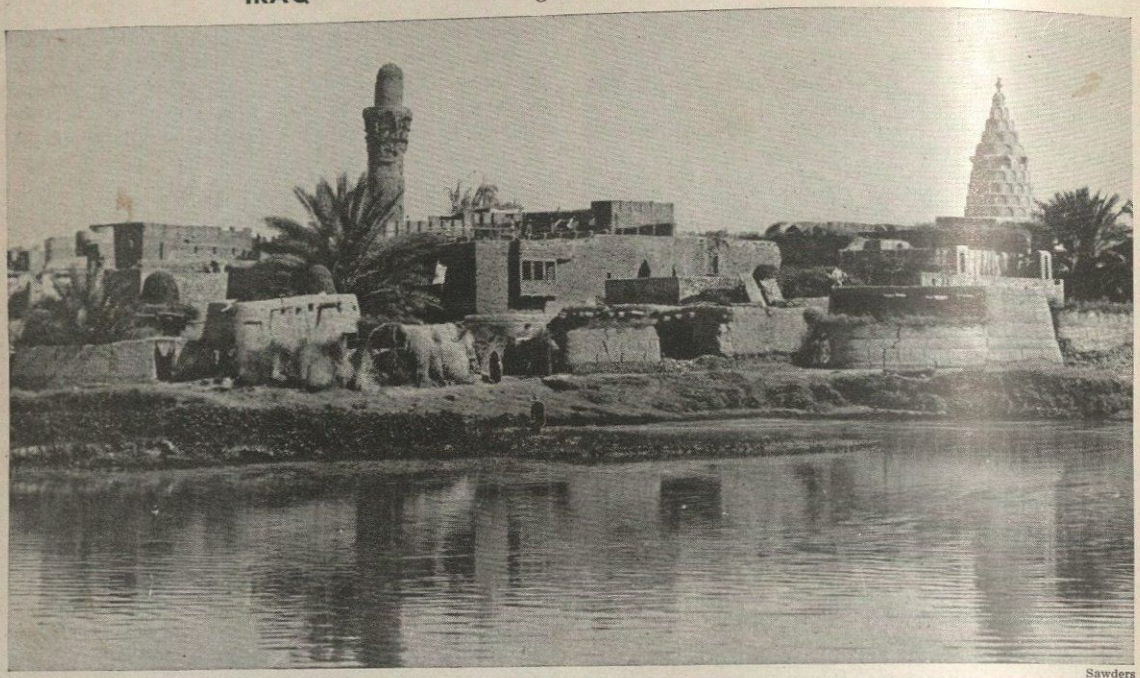
The People. Iraq has an estimated population of 4,800,000. The people are called Iraqis. There are about 41 persons for every square mile of land. About fifteen of every hundred persons live in cities. Most of the people are Arabs, but about 500,000 Kurds, 100,000 Turks, and 100,000 Persians live near the borders of the country.

The Kurds are tribal herdsmen who live in the valleys of Kurdistan and move from one pasture land to another. The Arabian desert is also inhabited by wandering herdsmen. Races have mingled in the river valleys and cities. But the tribesmen of the borderlands keep to themselves. Arabic is the official language of Iraq. Kurdish is the semi-official language for those provinces where the majority are Kurds.

Way of Life. Most Iraqis live the same sort of primitive life their ancestors lived in ancient times. Herdsmen live in tents and travel on camels. They wear long white robes which reflect heat and absorb moisture. Villages and cities are largely made up of whitewashed mud houses. In the large cities life is more modern but still

Oriental Institute, University of Chicago

An Iraqi Workman with a Pickax, engaged in digging operations with an American archaeological expedition. The expedition uncovered a great aqueduct built long ago by the Assyrian king, Sennacherib. Iraq's many ruins show that the country was very important and powerful in ancient times.



Sawders

A Village of Iraq on the bank of the shallow Euphrates River. Many buildings of Iraq are made of dried mud covered with whitewash. The trees that spread between the buildings are date palms, which supply one of Iraq's chief crops.

very different from the life of European and American cities. Most of the land is owned by a small class of large estate holders. The common people are very poor.

Agriculture. Most Iraqis earn their living by farming. Wheat and barley are grown in the northern part of the river valley, rice on the river borders, and tobacco in the mountains. Dates are an important product and the date industry is directly under the control of the government. Sheep, cattle, water buffaloes, camels, and the famous Arabian horses are raised.

Primitive farming methods are used. Getting water to the fields is a large part of the farm work in Iraq. Small dams, called *wevis*, are built out into the rivers. These have crude water wheels at the ends. The river moves the wheels, bringing the water up in little cups attached to their sides. The cups spill the water into a runway, which carries it to the fields.

Trade and Industry. Iraq's chief imports are cotton goods, sugar, tea, clothes, iron and steel, and machines. The chief exports are dates, oil, grain, wool, animals, and hides. One third of the country's trade is carrying goods from other countries to Iran, which has few good ports. The production and refining of oil is the only important industry.

Transportation and Communication. The rivers are important highways for travel. Some river boats are round like bowls and made of reeds covered with pitch. The camel is the chief means of travel in the desert, and elsewhere the donkey is used. Most of the roads are caravan paths. Iraq has about 4,500 miles of roads, but only 1,400 miles with hard surfaces. Bus systems carry traffic over the roads. A railroad connects Iraq with the rest of the world and joins the three chief cities, Mosul, Baghdad, and Basra. Many air lines stop at these cities on their way from Europe to India and the Far East.

Education and Religion. The primary schools of Iraq are free, but only about 150,000 pupils attend them. There are special schools for Jewish and Kurdish children. Iraq has more than 150 secondary schools and about ten colleges. Most of the people are Moslems. There are also about 100,000 Christians and 90,000 Jews.

Cities. For a description of Baghdad, the capital of Iraq, see BAGHDAD.

Basra, *BUS rah* (population about 100,000), is the chief port of Iraq. It lies near the Shatt-al-Arab about 80 miles inland from the Persian Gulf. The old city is about two miles from the river, but the new suburb, Ashar, is the actual port. The river is only 26 feet deep at high tide, so many ships stop farther down the river. Modern Basra was founded by the Arabs in A.D. 638. It is famous in literature as *Bassorah*, the scene of many of the adventures of Sinbad the Sailor, a hero of the *Arabian Nights*.

Mosul, *moh SOOL* (population about 109,000), is the most important city in northern Iraq. It lies on the right bank of the Tigris River. The ruins of the ancient city of Nineveh lie a mile away across the river. Mosul is an old trading city, where the grains, fruits, and sheep of the region are bought and sold. It was an ancient center for native craftsmen. "Mosul bronze" pieces and muslin, a fine cotton textile, were named for the city. The most impressive building is the Great Mosque, formerly a Christian church.

Mosul declined in modern times. But it became important again after oil was discovered in the near-by hills. A railroad built in 1940 linked Mosul with Baghdad and Basra in the south and Turkey and Europe in the north.

Government

Iraq is a limited monarchy, according to a law passed by the Constituent Assembly in 1924. The government of Iraq is somewhat like that of Great Britain. The king

selects a Prime Minister, who names a cabinet, which must be approved by the legislature. The Cabinet can be removed by the legislature. The legislature, or Parliament, has two houses. The senate is made up of no more than twenty-nine "old and wise men" who are appointed by the king, and the lower house has 138 elected members. Since 1944, the king has had the power to dismiss his government. Iraq is really ruled by the king with the help of a small group of aristocrats. There are civil courts; and religious courts for matters of inheritance, marriage, and divorce.

History

The earliest civilizations in Mesopotamia flourished for a time and then decayed. They included Babylonia, Assyria, and Chaldea. After the ancient civilizations of Mesopotamia declined, the country was conquered by the Arabs. Later it became part of the Ottoman Empire of the Turks. It was still in Turkish hands when British forces invaded the Near East during World War I.

After the war, the people revolted against foreign rule, and the British were forced to give the country its own government. The Iraqis elected King Feisal I to the throne in 1921. Great Britain kept control over Iraq through a mandate from the League of Nations. Feisal I proved a good ruler. He helped the Iraqis in their attempts to gain independence. In 1930 Great Britain signed a treaty recognizing the independence of Iraq. The country became a member of the League of Nations in 1932. King Feisal was followed by his son Ghazi in 1933. At Ghazi's death in 1939, King Feisal II became ruler. A regent ruled for him during his childhood.

Iraq remained friendly to Great Britain, and during World War II continued to sell its oil to the United Nations. German agents tried to start a revolution against the British, but the British drove them out. Iraq declared war on Germany, Italy, and Japan on July 17, 1943, and became one of the United Nations.

Sawders

Native of Baghdad, Iraq, spinning cotton yarn. As the man walks, the threads reel off the spindles onto the frame.

In 1948, Premier Saleh Jabr of Iraq signed a twenty-year treaty with Great Britain. This treaty provided British protection and military aid for Iraq. It also guaranteed the British the use of the two airfields which they had built at Habbaniya and near Basra. Rioting Iraqis protested this treaty, and the regent rejected it.

Iraq joined with other Arab League countries in 1948 to fight the Jews in Palestine. The oil pipeline to Haifa, Palestine, was closed, and Iraq fell into financial difficulties because of the loss of oil revenue.

By 1949, the Communist underground organization was gaining strength in Iraq. The Communist party had been outlawed since 1938, but secret agents worked among various classes and racial groups in Iraq, playing upon their dislike for the British and for each other. R.PEA.

See also ASSYRIA; BABYLONIA; FLAG (color plate, Flags of Asia); KURDISTAN; MESOPOTAMIA; TURKEY (History).

Questions

Why is it said that the Tigris and Euphrates are the life blood of Iraq?
Where are the chief oil fields of Iraq?
Why is irrigation needed in Iraq?
Who owns most of the land in Iraq?
What city of Iraq was the scene of many adventures of Sinbad the Sailor?

IREDELL, JAMES. See NORTH CAROLINA (Famous North Carolinians).

IRELAND. See EIRE; NORTHERN IRELAND.

IRELAND, JOHN (1838-1918), was the Roman Catholic Archbishop of St. Paul, Minn., from 1888 until his death. He was born in Ireland, and educated in France. His family moved to the United States when he was a child. Ireland was ordained in 1861. He was an ardent patriot and served as a chaplain in the War between the States. Ireland became coadjutor bishop in 1875, succeeded to the see of St. Paul in 1884, and was made an archbishop in 1888. He was a fiery preacher for American ideals and for the rights of the working class. Among his building projects were the Cathedral of St. Paul and the St. Paul Seminary. He wrote the book, *The Church in Modern Society*, and many articles. F.J.S.

U&U

John Ireland, Archbishop of St. Paul, was called the "Consecrated Blizzard" for his energetic activity in church and civil affairs.

IRENE (752-803) was empress of the Byzantine or Eastern Roman Empire (A.D. 792-802). She took the throne from her son, Constantine VI, but the nobles of her court turned against her. She was exiled to Lesbos.

IRIDIUM, *ih RID ih um* (chemical symbol, Ir), is one of the rare precious metals of the platinum group. In its metallic state, iridium is lustrous silver-white in color, but it takes on all the colors of the rainbow when dissolved in hydrochloric acid. For this reason, iridium is named for Iris, the Greek goddess of the rainbow. Iridium is twenty-two times as heavy as water, and it is one of the hardest pure metals. Next to osmium it is the most

refractory metal known. Iridium is more expensive than platinum because of its scarcity and hardness. Iridium is usually found in gravel deposits, chiefly in Russia and California.

It is combined with platinum to make a very hard compound which is used in chemical utensils, electrical contact points, and standard weights and measures. Iridium is also used in making jewelry, fountain-pen points, surgical instruments, and is used in photography. Iridium is in group two of the chemical elements. The atomic weight of this metal is 193.1, and its atomic number is 77. H.A.Sc.

IRIGOYEN, *EE ree GO yayn*, **HIPÓLITO** (1850-1933). See ARGENTINA (History [Later Struggles for Power]).

IRIS. See EYE (Parts of the Eye).

IRIS, *EYE ris*. This popular plant has large beautifully colored flowers. The name *iris* comes from the Greek word for *rainbow*. Irises are also called *flags*. They grow in many places throughout the temperate regions.

Several things about the iris set it apart from other flowers and make it easy to recognize. The leaves rise directly from the bulb, or rootstock. They are usually narrow and erect. The unusual shape of the flowers sets them apart from other plants. They are made up of three sets of parts, which resemble petals. The outer set of three, called the falls, curves outward, while three other segments come together at the top like an arch; these are known as standards. The third set is made of three petal-like stigmas that cover the stamens.

J. Horace McFarland

A Handsome Variety of German Iris, the species grown most commonly in gardens of the northern United States. Iris breeders call the erect upper parts of the flower the "standards," and the drooping parts the "falls." The inner part of the falls has a mat of soft fuzz, called the "beard."

The colors range from white and yellow to mauve and purple. They appear in many beautiful combinations, suggesting the colors of the rainbow.

Some species of iris have long been cultivated for their flowers. They show glorious yellows, bronzes, and reds. Irises come in many different sizes, from dwarf plants to others four and one-half feet tall. The *blue flag* is a common wild species that grows in swamps in the United States.

Irises bloom in spring and summer, from about March through July. They may be planted in the spring before blooming, or afterwards, in autumn. The plants are perennials, but give the best flowers if they are replanted about every four years. The roots tend to crowd each other, and must be respaced, or divided into new plants. Bearded varieties do best in sunny ground that is not too rich. The beardless kind can grow in damp rich soil.

Diseases of the iris include soft rot, crown rot, and leaf spot. If the disease is serious, roots and ground may have to be treated with germicides. The worst insect enemy is the iris borer. Its larvae eat their way through the leaves and roots, and almost always bring on soft rot. After the plants have bloomed, all roots should be examined for borers. They should be dug out with a knife.

The Florentine iris is the source of *orris root*, which is used in perfumes and medicine. Iris growing has become an important specialty. An active American Iris Society promotes this work in the United States. The iris is the state flower of Tennessee.

Fleur-de-Lis used in a conventionalized design

Fleur-de-lis is a name sometimes used for the iris. It is French for *flower of the lily*. Fleur-de-lis is also the name of a design that is supposed to represent the white iris. This design became the emblem of the kings of France in the 1100's. Charles V finally adopted three golden fleur-de-lis on a blue field as the coat of arms of the French kings. A.C.Ho.

See also FLOWER (color plate, Common Garden Flowers); FREESIA; ORRISROOT; POLLEN AND POLLINATION (color plate).

Classification. Irises belong to the iris family, *Iridaceae*. The species include the yellow iris, *Iris pseudacorus;* Spanish iris, *I. xiphium;* English iris, *I. xiphiodes;* dwarf bearded iris, *I. pumila;* blue flag, *I. versicolor;* and *I. barbata*, a hybrid species, which includes the bearded iris.

IRIS was the golden-winged goddess of the rainbow in Greek mythology. She was the messenger of the gods, especially of Hera who was queen of the heavens. Iris swiftly carried the commands of the gods to men on earth. The path she traveled was the rainbow.

In art, Iris is shown seated behind the chariot of Hera. She wears an airy garment of mother-of-pearl color. P.Col.

IRISH FREE STATE. See EIRE.

IRISH HOME RULE BILL. See ASQUITH, HERBERT HENRY.

IRISH LACE. See LACE.

IRISH LAND LEAGUE. See DAVITT, MICHAEL.

IRISH LITERATURE. The term Irish literature properly refers only to literary productions in the Irish, or Gaelic, language. But many distinguished Irish authors have written in English.

The people of Ireland had no written literature before the coming of Christianity, as far as we know. But they had a crude alphabet, called *ogam*, suitable only for inscriptions. They also possessed many traditions which later appeared in literary form. Christian missionaries came to Ireland before and during the time of Saint Patrick, who arrived in A.D. 432. They brought with them the art of writing, which they had learned from the Roman clerks who copied books in ancient France, or Gaul. The Irish adopted the Roman handwriting when they accepted Christianity. They improved upon the writing, and used it to set down their traditions.

The Golden Age. No written Irish literature earlier than the 600's has been preserved. But a large body of legends of saints, lyric poetry, and folk stories, or *sagas*, remains. These were composed from about A.D. 700 to 1000, but most of the surviving manuscripts date from a later period. This early period has been called the Golden Age of Irish literature.

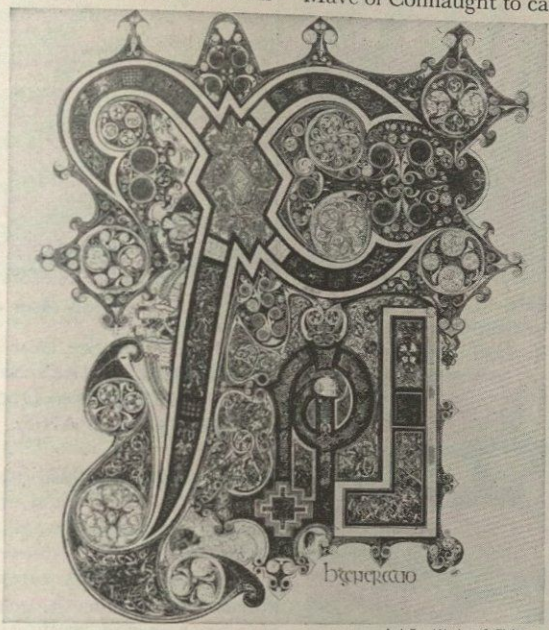
The early Irish produced many legends about saints. Among these are several notable lives of Saint Patrick, which tell something of the work of the great apostle to the Irish. Christianity flourished so abundantly during the Golden Age that medieval Ireland has been called the Island of Saints and Scholars. Irish missionaries led by Saint Columba brought Christian culture to the north of Britain. Other Irish missionaries helped to re-establish Christianity on the continent of Europe after the barbarian invasions.

Early Irish manuscripts contain a large number of lyric poems, many of which are real gems of poetic art. Numerous early Irish lyrics were composed by hermits. These poems often deal with the natural surroundings of the authors. They show a freshness of appreciation and a true love of nature found nowhere else in the literature of the Middle Ages.

The largest body of early Irish literature consists of sagas, romances, and heroic tales. These are composed in prose mingled with verse. They fall into three groups, or cycles.

The Mythological Cycle. This group deals with the loves, battles, and other deeds of the Tuatha Dé Danann, and other peoples. They are supposed to have settled in Ireland before the beginnings of history. Chief among the characters were the *sidhe*, or *she*, who still appear as the fairies of modern Irish folklore. Some of the characters in this cycle may have been ancient gods.

The Ulster or Red-Branch Cycle. The tales of this group relate the deeds of the heroes of ancient Ulster. They center around the court of King Conchobar, who is said to have ruled Ulster about the time of Christ. The chief hero is the boy champion, Cu Chulainn. The ancient Irish storytellers never tired of relating his marvelous deeds. The longest of the Ulster epics is the *Cattle-Raid of Cooley*. It tells of the efforts of Queen Mave of Connaught to carry off from Ulster the famous brown bull of Cooley. Cu Chulainn defends the frontier against her whole army without any help.



Art Institute of Chicago

The Irish "Book of Kells" is famed for its beautiful decorations. This intricate design of the letter P covers a whole page. The book was written and drawn by hand sometime during A.D. 700. It contains the four gospels from the Bible.

The Finn or Ossianic Cycle. This group includes sagas, romantic tales, and many ballads about the deeds of the famous chief, Finn MacCool and his son Oissin, or Ossian. Finn MacCool is supposed to have lived during the third century. His son is better known through the pretended translations (really original compositions) published by James Macpherson about 1760.

The ancient Irish were fond of music, and Irish harp players were popular in the courts of western Europe. The copyists, or scribes, developed to a high degree of perfection the art of writing books and of decorating manuscripts. One of the earliest manuscripts decorated in the Irish style is the *Book of Kells*. Many people consider it the most beautiful book in the world.

Scandinavian invaders destroyed many manuscripts containing Irish literature after they began to arrive late in the 700's. After the Normans came, Irish literature gradually declined in quality. Literature in the Irish language never flourished under English rule. The poets, or bards, who composed in that tongue grew ever fewer. The professional storytellers, or *shanachies*, still went through the country singing their ballads and relating ancient traditions. But native Irish literature since the Middle Ages shows few traces of genius and holds little of interest except for scholars.

Works in English

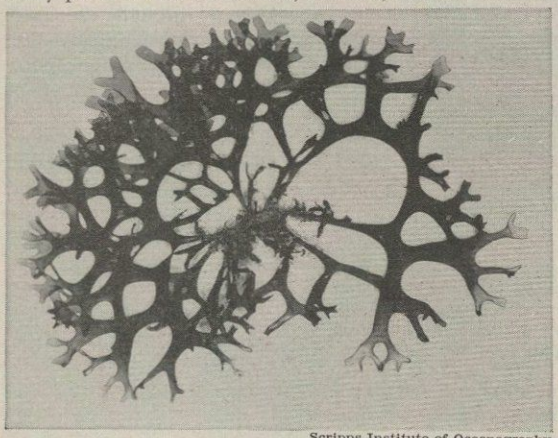
A few Irish authors began to write in English during the reign of Queen Elizabeth. An increasing number of Irishmen have continued to write in English since then. Among them have been writers of distinction, including Oliver Goldsmith, Maria Edgeworth, and Richard Brinsley Sheridan. But their works contain

little to identify these writers as Irishmen. The poetry of Thomas Moore helped to create an interest in Irish traditions, but it has little of the spirit of real Irish poetry.

A group of young Irish literary men attempted to create an Irish literature in the English language late in the 1800's. Among them were William Butler Yeats and George Russell, who used the letters AE as his pen name. The efforts of this group brought about what is known as the Irish Literary Revival. The drama profited especially by this movement. The famous Abbey Theatre Players in Dublin began performing plays on Irish themes early in the 1900's. Other well-known dramatists who have written in English recently are Lady Gregory and John Millington Synge, who wrote about the fisherfolk of the Aran Islands. Famous Irish writers of verse or prose in English include Oscar Wilde, George Bernard Shaw, Padraic Colum, James Stephens, and Sean O'Casey. But their works actually belong to English literature instead of Irish. T.P.C.

See also DRAMA (The Irish Revival); GREGORY, AUGUSTA, LADY; MOORE, THOMAS; SYNGE, JOHN M.; YEATS, WILLIAM B.

IRISH MOSS, or **CARRAGEEN,** *KAIR ah GEEN*, is the name of several kinds of seaweed which grow in rocky places of Great Britain, Ireland, and the eastern



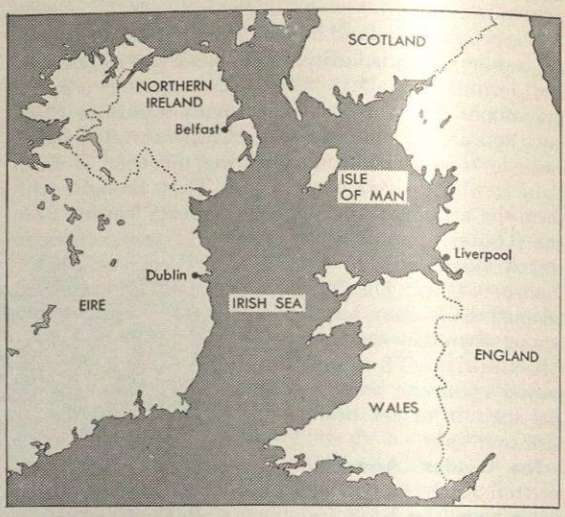
Scripps Institute of Oceanography

Irish Moss Is a Valuable Seaweed that is used for food and in making certain medicines for lung diseases.

coast of North America. The most common Irish moss has thick, forked fronds which are shaped like a fan. It is reddish-brown or purple in color. It is sold commercially after it has been washed, bleached, and dried in the sun. Irish moss is not very nutritious but is very much sought after as the basis of soups and desserts. Irish moss is also used by painters as the foundation of size, or a protective coat. See also SEAWEED. L.H.T.

Classification. Commercial Irish moss, *Chondrus crispis*, belongs to the family *Gigartinaceae*.

IRISH SEA. This small sea separates Ireland from England and Scotland. The Irish Sea opens into the Atlantic Ocean through Saint George's Channel on the south and through the North Channel on the north. The Irish Sea is about 130 miles long, and is 140 miles wide at its widest point. The eastern half of the sea is shallow, but the northwestern part reaches a depth of about 850 feet. The Isle of Man lies in the north-central section of the Irish Sea. The island of Anglesey lies off Wales. See also MAN, ISLE OF. H.U.S.



Location Map of the Irish Sea

IRISH SETTER. See DOG (color plate, Sporting Dogs).

IRISH SWEEPSTAKES. See EIRE (Recreation).

IRISH TERRIER. See DOG (color plate, Terriers).

IRISH WATER SPANIEL. See DOG (color plate, Sporting Dogs).

IRISH WOLFHOUND. See DOG (color plate, Hounds).

IRITIS, *eye RI tis*, is a condition in which the iris of the eye becomes inflamed. There is redness, tenderness of the eyeball, and intense pain. The eye is very sensitive to light. Iritis often results from rheumatism; diseased tonsils, teeth, or nasal sinuses; or many other infections in the body. It is a serious condition and should be treated by a competent eye specialist. P.R.C.

IRKUTSK, *er KOOTSK*. See SIBERIA.

IRON AGE. The use of metal had a great deal to do with the way prehistoric people lived. Very early peoples made tools and weapons from chipped or polished stone. Later they used copper and brass. Somehow they discovered that iron was harder than brass, that it would take a sharper edge, and that it was much easier to work. Iron made so much difference in man's way of life that we use the name *Iron Age* for the period in which early peoples learned to use it.

The first iron implements seem to have been beaten or hammered into shape. Such implements are said to be made of *wrought* iron. Many of them were skillfully made and beautifully decorated. A few had symbols and markings on them, indicating the beginning of writing.

Southern Europe learned the use of iron long before the northern countries. The Iron Age had begun in Greece and the Aegean Islands during the period portrayed by Homer in his *Iliad* and *Odyssey*. But the people of the Norse lands knew little of iron before the time of Julius Caesar, about fifty years before Christ. A.V.K.

See also BRONZE AGE; DRESS (Dress of Prehistoric Times); IRON AND STEEL; STONE AGE.

IRON AND STEEL. If all the iron in the world were to disappear today, the result would be worse from an engineering standpoint than if a huge atomic bomb exploded. The atomic bomb would leave some parts of buildings standing. But should iron disappear, our tall buildings would topple to the earth. Our wooden houses would fall apart for lack of nails. Our cars and trains would be only little piles of wood and rubber. Railroad and streetcar tracks (made of steel, a form of iron) would vanish. We would not even have stoves on which to cook our food.

Industry depends on this valuable metal more than on any other element of nature. Nearly all machines and tools in factories and on farms are made of some form of iron. Iron also makes possible many of our means of communication, including the telephone, telegraph, and radio. Iron is even necessary to our bodies, as it supplies the hemoglobin which gives the red color to our blood, and keeps us healthy. In plants, iron is the life-giving chlorophyll that makes leaves green.

The United States produces more than $1,000,000,000 worth of pig iron in an average year. The value of this product is greater than that of any other single manufactured product. It is also greater than the value of all other metals combined.

The value of all steel products, most of which are made from pig iron, is nearly $3,000,000,000 a year.

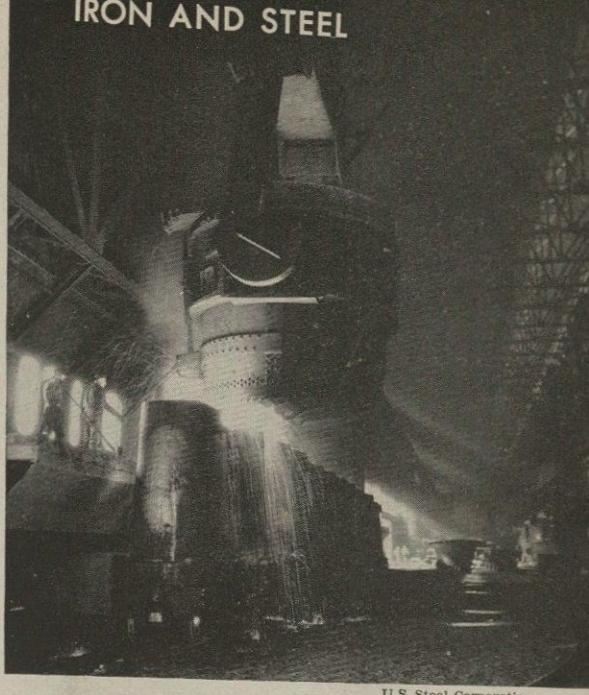
Iron Ore

This metal which is so important to our daily lives is found in both earth and rock. It is seldom found in a pure state. But when it is, there are certain physical qualities, or *properties*, which identify iron beyond question.

Properties. Pure iron looks very much like silver. It can be hammered into thin sheets or drawn out into very fine wires. Iron unites easily with nonmetals, such as sulfur, oxygen, and carbon. The tendency of iron to unite with oxygen is the reason that we so often see rusty iron. Iron and oxygen form a chemical compound called *iron oxide*, which is actually rust. Iron may be combined, or *alloyed*, with many other metals. An alloy of $\frac{1}{4}$ to $2\frac{1}{2}$ per cent carbon in iron makes steel. (See OXIDATION; RUST.)

Chemists have a system of symbols for each metallic element. The symbol for iron is *Fe*, which is the first two letters of the Latin word *ferrum*, meaning *iron*. There is also a table of chemical elements which numbers and groups elements according to their physical properties and weight. Iron (Fe) is placed in Group IV of this table. Iron has an atomic number of 26, and an atomic weight of 55.84. The metal has a specific gravity of 7.8, which means that a piece of iron weighs 7.8 times as much as an equal amount of water. Scientists have also set up a scale of hardness by which they can classify the hardness of all minerals. In this scale, iron falls into Group V. This means that the metal can be cut with a knife, but only with great difficulty.

Iron will dissolve in water, although the process takes a long time. The iron of the earth is constantly being carried by rainfall and flood water from one place to another.



U.S. Steel Corporation

How Iron Is Formed. Scientists believe that iron was formed at the time the earth was created. Iron makes up about 5 per cent of the earth's crust and is found all over the world. The purest iron is found in the metallic bodies called meteorites which sometimes fall to the earth out of the sky. The iron ore in the earth contains many impurities. These impurities are other chemical elements such as sulfur, carbon, phosphorus, lime, magnesia, arsenic, silica, copper, and titanium.

Kinds of Iron Ore. There are many different kinds of iron ores. They include limonite, goethite, hematite, magnetite, siderite, pyrite, marcasite, and pyrrhotite.

Hematite, sometimes called *specular* iron because of its metallic shine, is the source of 90 per cent of the iron produced in the United States. This ore contains 70 per cent iron and can be easily identified by its dark red to black color. Hematite leaves a cherry red to dark red mark, called a *streak*, when it is scratched across harder materials. Scientists use this streak test to identify many minerals, but especially to identify the different iron ores. Hematite is found in masses or in long, pointed shapes, called *crystals*. It is harder than most iron ores, and has a table of hardness rating of 6. This means that it can be scratched, but not cut, with a knife. The chemical symbol of hematite is Fe_2O_3. This means that it contains much oxygen as well as iron. The oxygen is the cause for its rusty color. The ore weighs less than an equal amount of pure iron. A piece of hematite weighs only 5.2 times as much as an equal amount of water.

Limonite is the source of only about 1 per cent of the iron produced in the United States. But it is an important source of iron in Sweden and Scotland. Limonite contains about 60 per cent iron and is yellow-brown to black in color. It streaks a yellow-brown. Limonite is found all over the world. It is not so hard as hematite, having a table of hardness rating of 5. The chemical symbol of limonite is $2Fe_2O_3 \cdot 3H_2O$. This means that limonite contains much water in addition to iron oxide.

It is lighter than hematite, weighing only 3.8 times as much as an equal amount of water.

Magnetite, or magnetic iron ore, is the source of about 3 per cent of the iron in the United States. In Norway, Sweden, and some other European countries magnetite is the chief source of iron. The ore contains 72.5 per cent iron. It can be easily identified because it is *magnetic*, or attracts other metals. Magnetite is black, and makes a black streak. It is found in large masses or in lumps called *crystals*. Magnetite is as hard as hematite, with a table of hardness rating of 6. The ore weighs 5.8 times as much as an equal amount of water. Its chemical symbol is Fe_3O_4.

Siderite is sometimes called *spathic iron* because it can be separated into thin plates. It is scarcely ever used in the United States as a source for iron. But it is widely used in Germany and England. It contains only about 49 per cent iron and is identified by its gray-brown color. Siderite makes a white streak. The ore is found both in stringy masses and in rounded crystals. It has a hardness rating of only 3.5, so it is quite soft. It can be cut with a knife. Chemists give siderite a symbol of $FeCO_3$. The ore weighs 3.8 times as much as an equal amount of water.

Pyrite, *goethite*, *marcasite*, and *pyrrhotite* are all poor sources of iron. Pyrrhotite and goethite are rare and pyrite and marcasite each contain so many impurities as to be of little use in making metal.

Sources of Iron. Iron is present in some degree almost every place on earth, but it is mined only in those sections of the world where it is of the purest quality and where it can be reached easily. The thickness of the deposits of iron also is considered when mining it. Probably the purest iron of the world, except for meteoric iron, is found at Disco Island, Greenland. This pure iron is taken in large chunks from a *basaltic rock*, which has been formed by gases and liquids thrown off by volcanoes deep beneath the surface of the earth. These gases and liquids rise to the surface through cracks, or *faults*, in the earth's crust. When they cool, they form a hard mass called *igneous* rock. An *igneous* rock is *basaltic* when it breaks away into smaller boulders. The basaltic rock at Disco Island breaks away into boulders of almost pure, or *native* iron. Some of these iron rocks weigh as much as twenty tons. See BASALT; IGNEOUS ROCK.

Hematite is the principal iron-producing ore of the United States. It is mined on the northern and western banks of Lake Superior in the Mesabi iron range of eastern Minnesota. Here the ore is so loose that it can be scooped up with power shovels. For many years the Mesabi Range produced three of every four tons of iron ore mined in the United States. Another great source of hematite ore is the famous Clinton Range. This vein of iron ore starts as a foot-thick layer in New York and extends south through the Appalachian Mountains to Alabama, where the vein reaches a thickness of more than ten feet.

Limonite is found in nearly all countries. It is sometimes found at the bottom of ponds, where it may be as deep as six inches. These deposits are called *bog iron*. It is also found forming a nonsulfurous cap over veins of sulfide minerals. In such cases it is called *gossan*, a word from the Cornish language meaning *iron hat*.

Much magnetite is found in the Scandinavian countries, in the Adirondack Mountains region, and in New Jersey, Pennsylvania, Arkansas, North Carolina, New Mexico, and California.

Siderite occurs throughout the Appalachian Mountains, and also in Massachusetts, Connecticut, New York, and Ohio.

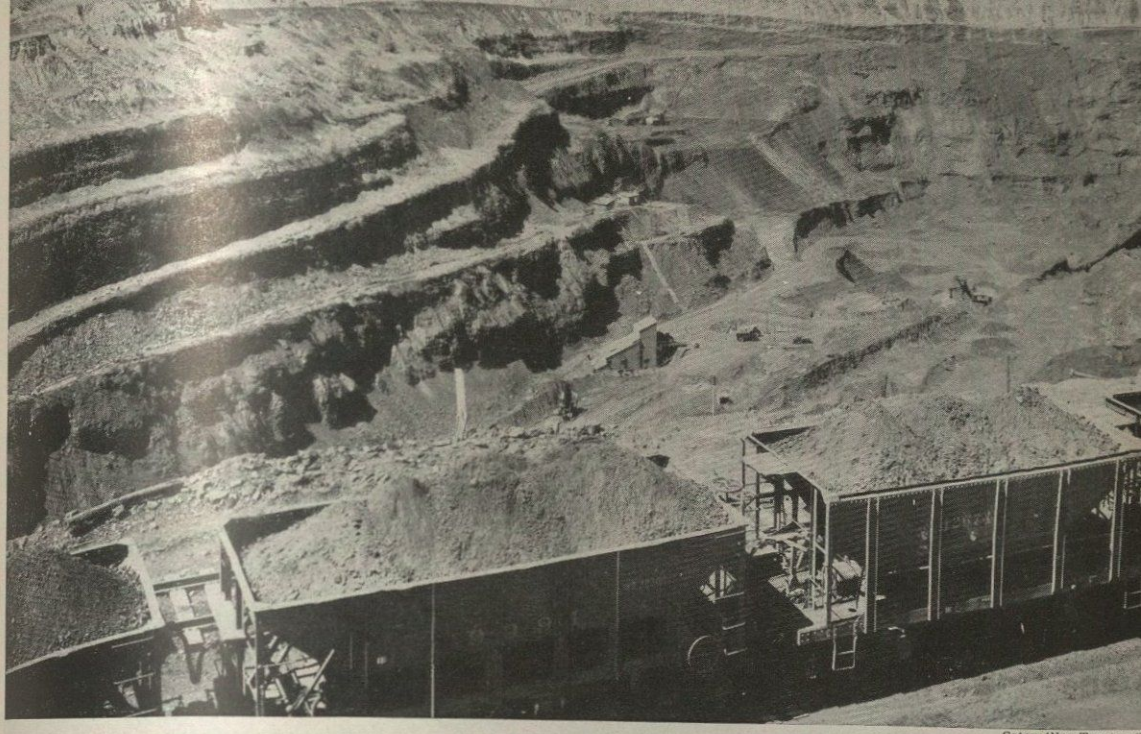
How Iron Is Mined. The methods of mining iron depend on the type of ore deposit and its depth in the earth. A bog-iron deposit is mined by methods similar to the *placer mining* of gold. Huge shovels dip the iron sediment from the bottom of the pond. Straining equipment is then used to separate the iron from the other minerals in the ore. Power shovels are used to mine iron ore which is near the top of the ground, as in the great Mesabi Range of Minnesota. Such mining is called *open-pit* mining. The shovels scoop up large amounts of the ore and place it on boats and trains to be taken to the mills. Iron which lies near the surface but is buried in rock is loosened from the rock by means of dynamite placed in holes bored into the rock by drills. This is called the *opencut* method. Iron which lies beneath the ground is mined much the same as other underground metals. Tunnels are dug along the vein of iron, and tunnel openings, called *adits*, are provided so that men may enter the tunnels.

How Iron Is Made

Some of the impurities which iron ore contains tend to weaken the iron for practical uses. Oxygen, which causes rust, actually eats away the metal. Sulfur and phosphorus cause iron to be very brittle and to break easily. Therefore, it is necessary to remove these impurities before the iron can be used.

The Blast Furnace. One of the most common methods of purifying iron is the blast furnace. This furnace is the center of an elaborate system which includes every step in the production of pig iron. If the furnace stops, the whole system must close down. For this reason, iron manufacturers refer not only to the furnace itself but also to all the various equipment connected with it as *the blast furnace*.

In order to understand better the workings of a blast furnace, let us follow the iron ore from the moment it enters the yards. Large cranes unload the ore from the boats or trains and dump it into piles. Quantities of limestone are dumped on other piles in the yards. Another large crane, called an *ore bridge*, picks up these materials and places them in storage bins close to the blast furnace. There are separate bins for the iron ore, for the limestone, and for the coke which is used to fire the blast furnace. The furnace is loaded with a mixture, called a *charge*, of certain amounts of coke, limestone, and ore. The charge is then loaded onto a *scale car*, which weighs the materials so that a load of exactly the right size is made up. The charge is now deposited into a *skip car*, which travels up a sloping track to a position over the blast furnace. The blast furnace itself is a tall, chimneylike structure which may be a hundred feet high. It is made of firebrick held together by bands of steel. At the very top of the furnace is a small bin, or *hopper*. The skip car dumps the charge into this hopper.



Caterpillar Tractor C

Iron Ore Is Scooped from This Open-Pit Mine near Hibbing, Minn., and loaded into railroad cars. Then it is hauled to the shore of Lake Superior and transferred to boats, whi carry the ore to Great Lakes smelting centers.

U.S. Steel Corporatio

The Temperature of a Roaring Open-Hearth furnace is taken with a special thermometer called a pyrometer. The great heat would melt any ordinary instrument, but this one measure it exactly by both chemical and electrical means.

Molten Steel Is Poured from an Electric Furnace by tilting it. The liquid metal spills into a ladle carried by a traveling crane. The electric furnace is very efficient in making quality steel, because its heat is easy to control.

U.S. Steel Co

Showers of Sparks Fly from the Grinding Wheels as workmen smooth a slab of stainless steel. The grinding takes off scaly particles and small cracks that may have been the slab by the big rollers in the rolling mill.

in making fine-
.

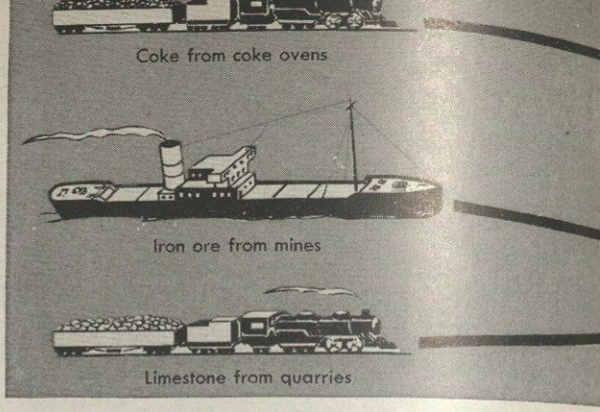
Steel Corporation
been left on

A White-hot Block of Steel, Called an Ingot, is lifted from a heating pit by a huge crane. The ingot is the form into which all iron and steel is poure
This ingot will be shaped into sl

A Coil of Sheet Steel for Making Automobiles is pressed to correct thickness by the powerful rollers of this machine. As it comes from the rollers, it is bei
on the dial board before it is w

The hopper bottom, called the *bell*, opens downward, allowing the charge to fall into a much larger hopper. After six loads have been transferred from the small hopper to the larger one, the bell of the larger hopper also opens downward and the charge falls into the shaft of the furnace. This *double-bell hopper* system keeps gases from escaping from the furnace when it is loaded. The bells are timed so that only one may open at a time. As the charge passes slowly down through the furnace, it is struck by hot blasts of air about eight feet above the base of the furnace. This air enters the furnace through about a dozen holes, or nozzles, called *tuyères*, which are placed around the furnace. The hot air causes the coke in the charge to burn and give off carbon monoxide gas. The tiny particles called *molecules*, which make up the gas, hold one atom of carbon and one atom of oxygen each. But the tendency of carbon is to combine with *two* atoms of oxygen. So when the gas comes in contact with the iron each molecule of carbon monoxide picks up an atom of oxygen. This robs the iron of oxygen and removes one of its main impurities. Now the terrific heat of the furnace (usually from 2800° F. to 3000° F.) begins to melt the iron ore. The melted iron trickles down to the lowest portion of the furnace, called the *crucible*, or *hearth*. Many of the impurities which iron contains do not melt at temperatures as low as the melting point of iron. These would remain solid particles in the melted iron if the limestone had not been added to the charge. But the limestone causes the impurities to melt and run together, or *flux*. Pure iron has a much heavier weight than many of these impurities do, so the iron goes to the bottom of the melted mass. The impurities float on top of the iron in what is called a *slag*, or *cinder*. The slag is drawn off through a hole just above the hearth, at the *cinder notch*. The melted iron is drawn off from the furnace at a point almost level with the floor of the furnace, called the *iron notch*. The operation of the blast furnace is timed so that melted iron is drawn off several times during the day, and the charge is loaded often enough to keep the shaft of the furnace always full. Blast furnaces are usually operated day and night.

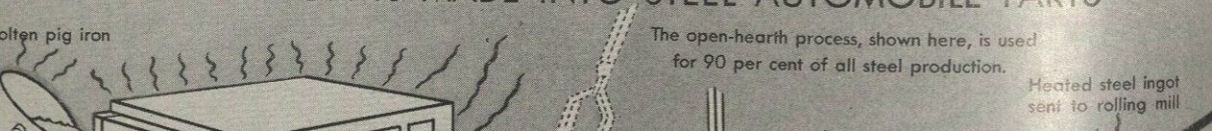
There are many machines which must be grouped around the blast furnace to keep it going. For instance, the hot air which is blown through the tuyères is heated in four or more *hot-blast stoves* which stand beside the furnace. These stoves heat the air to about 1200° F. Then the air is forced through a pipe to the tuyères under a pressure of about sixteen pounds per square inch. Each hot-blast stove operates separately. One stove is heated and used to blow air into the furnace for about one hour, then it is shut off from the furnace while the air in it reheats. During this time, another hot-blast stove is used to heat the air for the blast furnace. When coke burns with the hot air in the blast furnace, it produces a gas which has about one fifth the fuel value of city gas. This gas is taken out of the furnace by two pipes, called *gas uptakes*, at either side at the top. The uptakes lead into a large pipe which carries the gas into a tank called the *dust catcher*. The dust catcher strains much of the solid matter from the gas, then pipes it into a machine called the *gas washer*, which thoroughly cleans it. The gas is then burned under boilers which create steam pressure. This pressure operates the blowers which force the hot air from the hot-blast stoves into the tuyères of the blast furnace. The gas is also sometimes burned to reheat the hot-blast stoves.

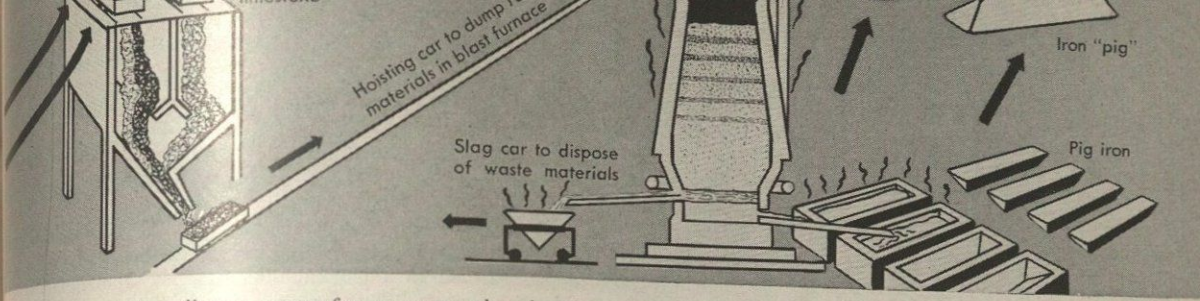


Pig Iron is the product of the blast furnace. When the melted iron is removed through the iron notch, it is run into molds. The molds are then moved on a chain through cold water, and the iron hardens into bars called *pigs*. After the bars are cool, they are ready for shipment.

Pig iron is not pure iron. The slagging-off process does not always remove all the slag from the molten metal. Some of the impurities never become slag anyway, but remain in the molten iron. Thus, pig iron is only about 95 per cent iron. It usually contains from 3 to 4 per cent

HOW PIG IRON IS MADE INTO STEEL AUTOMOBILE PARTS





carbon and smaller amounts of manganese, phosphorus, sulfur, and silicon.

Pig iron might be called the raw material of the steel industry. Most of our steel and other forms of commercial iron are made from it.

Cast Iron is made by remelting pig iron and pouring it into specially shaped molds or *casts*. Cast iron is soft and rather brittle. The melting furnace which is used to melt pig iron for casting is a coke-burning furnace called a *cupola*. This furnace will remove a great deal of sulfur from the pig iron, but it does not remove phosphorus. The phosphorus in cast iron accounts for the brittleness of this metal. The carbon and silicon left in cast iron cause the metal to be soft.

Wrought Iron is another product of pig iron. The pig iron is placed on the hearth of a *puddling furnace*. Certain amounts of raw iron ore are also placed in the furnace. Under heat, the silicon and manganese of the pig iron form oxides with the oxygen in the iron ore. This leaves the iron in the ore free to combine with the molten pool of pig iron. The silicon and manganese oxides form a slag. This slag absorbs the phosphorus in the pig iron. Now workmen stir the slag and iron together in a process called *puddling*. Puddling causes the carbon in the molten iron to mix with the oxygen of the slag, and form carbon monoxide gas. The result is almost pure iron. This molten iron is converted into white, pasty balls filled with liquid slag. The balls are squeezed until the slag is removed. Then they are rolled into bars. A piece of wrought iron can be welded to another piece without solder. This operation is impossible with any other metal, except steel and platinum.

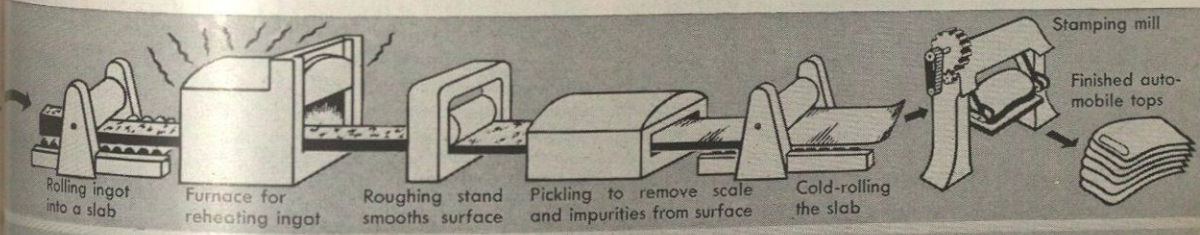
Uses of Iron

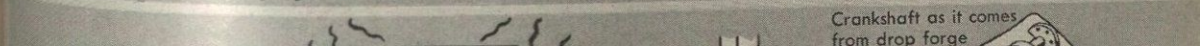
Iron is used for many things. Cast iron is used mostly for ornament. We see it in the brackets on school desks and on some heating stoves. Wrought iron is so easily worked that it can be used almost anywhere. It is used principally for bars, bolts, and plates. Pig iron in its raw state is not put to many commercial uses. Rather, it is used to make cast iron, wrought iron, and most important of all, steel.

How Steel Is Made

Makers of steel define it as a mixture, or alloy, of iron with $\frac{1}{4}$ to $2\frac{1}{2}$ per cent carbon. (See ALLOY.) Since iron from the blast furnace contains as much as 4 per cent carbon, the object of all steelmaking processes is to reduce the carbon to the desired percentage. This is done by heating the iron with other materials which will remove the carbon from the iron. After these materials have taken up the carbon, they are drawn off from the heating furnace as slag or as gas.

Blister Steel is made by placing bars of wrought iron in the puddling furnace and reheating them. The bars are covered with wood charcoal, and the heat of the furnace is brought up gradually. The iron soaks in the wood charcoal for a period of from seven to twelve days at high temperature. This causes the carbon in the iron to combine with the charcoal. Unfortunately, some of the carbon also combines with oxygen to form carbon monoxide gas. The gas forms bubbles in the steel which look like *blisters*. Blister steel is not considered a fine grade of steel, because the carbon which is left in the iron is not in even amounts throughout the steel. Thus,

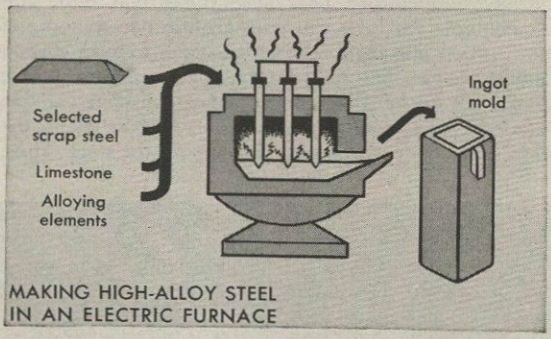




all parts of blister steel do not have the same strength and hardness.

Crucible Steel is made from blister steel or from pig iron. The crucible furnace consists of a melting pot, called the *hole*, and two pairs of *checker chambers*. These chambers are made of firebrick with air spaces in between, so that they look somewhat like a checkerboard. One pair of checker chambers is placed on either side and below the hole. Smaller melting pots, called crucibles, are lowered into the hole. These crucibles are made of 50 per cent clay and 50 per cent graphite, which is a carbon compound. The crucibles are the containers in which the steel is made. A mixture, or *charge*, of iron and other materials which absorb carbon is placed in the crucibles. Gas is heated in one of the checker chambers on one side. At the same time, air is heated in the other checker chamber on the same side. The gas and air unite in a flame over the pair of chambers. This flame passes through the melting pot around the crucibles and down through the checker chambers on the other side. At regular periods, the flow of air through the pairs of checker chambers is reversed. The heat is applied to the crucibles for about three hours. When enough carbon has been absorbed by the materials in the charge, the heat is shut off and the steel remains in the crucibles for about half an hour. This period is called *killing*. It is intended to allow any gases which may be present in the metal to escape. Later the crucibles are lifted from the hole by a man who is wrapped in wet bandages as protection against the intense heat. The steel is poured into molds to cool. After the molds are removed, the bars of steel, called *ingots*, are ready for rolling and forging.

Electric-Furnace Steel. The *Heroult* Furnace is the most popular of electrical furnaces. It is round, and the outside, or *shell*, of the furnace is made entirely of heavy iron plating. The inside is lined throughout with three layers of brick. The layer next to the shell is firebrick,

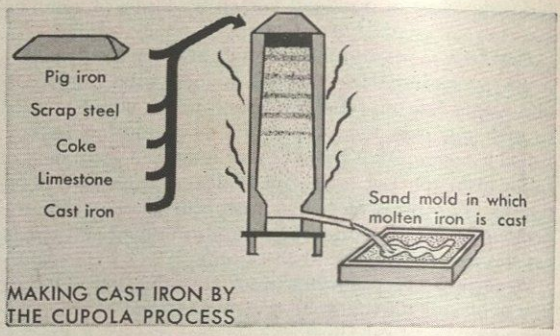


MAKING HIGH-ALLOY STEEL IN AN ELECTRIC FURNACE

and the two inside layers are magnesite brick. The bottom is built of double-burned magnesite. This type of magnesite throws back heat waves instead of absorbing them. The furnace is placed on two rockers. The men operating the furnace can tip the whole furnace when they wish to draw off or *tap* the molten steel. Electrically-charged pieces of carbon, called *electrodes*, extend from the roof of the furnace to the steel. The high heat is obtained because the path of electricity, or *electric arc*, is from one electrode to the next. That is, the current goes down through one electrode, travels through the steel to the next electrode, and then travels up the electrode. The electric furnace process is the best of all steel processes from the standpoint of control of quality. The operator can exercise full control over the make-up of the steel simply by changing the chemical composition of the charge.

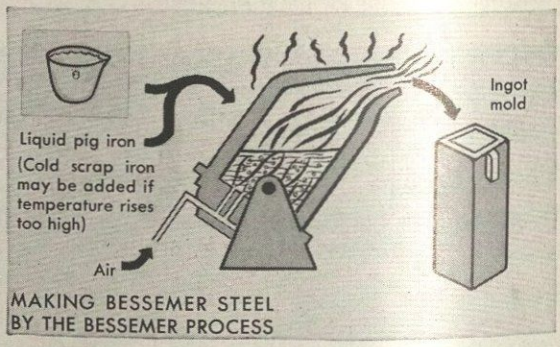
The electric furnace is rapidly replacing the crucible process in most steel mills, because it permits larger amounts of good steel to be made at a lower cost. See ELECTRIC ARC; ELECTRODE.

Bessemer Steel. A Bessemer department is similar to a blast furnace in that it includes much equipment besides the furnace. The Bessemer department consists of a round melting pot, called a *Bessemer converter*, which actually makes the steel, a giant mixer where the charge



MAKING CAST IRON BY THE CUPOLA PROCESS

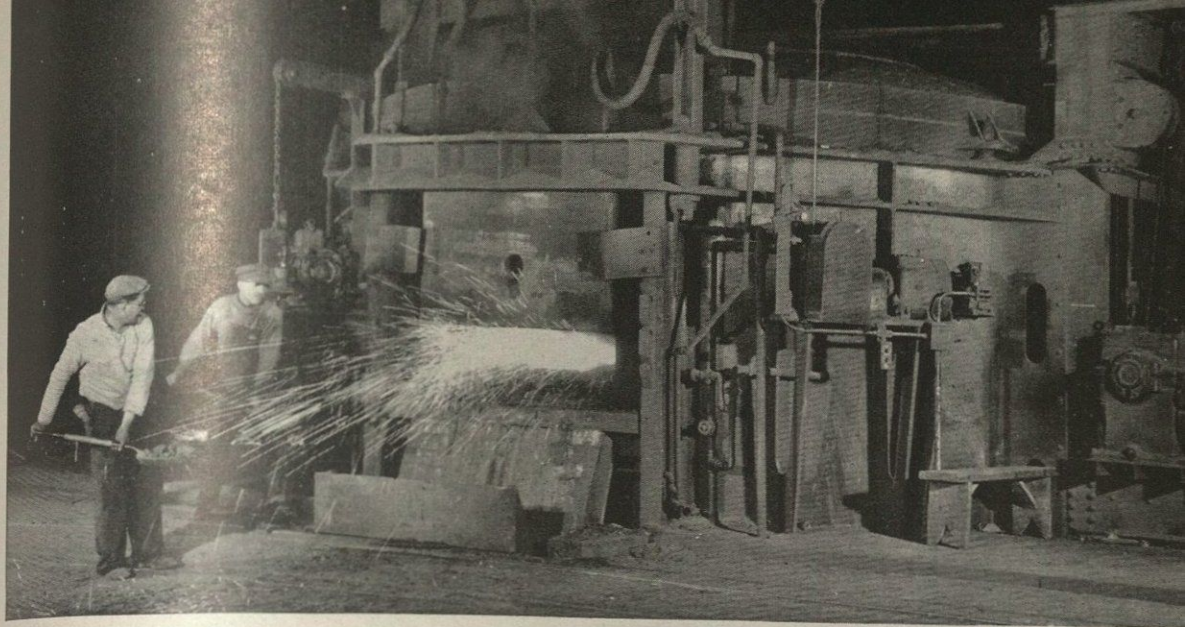
is prepared, and ladles which carry melted steel from the converters to a pouring platform where it is molded. Some Bessemer departments also have small blast furnaces, called *cupolas*, for remelting the pig iron before it is placed in the charge. However, most Bessemer departments are connected with the blast furnace, so that molten pig iron comes directly from the furnace to the mixer. Usually, the pig iron is brought to the Bessemer department in cars. As it enters the Bessemer department, the iron is lifted by cranes and placed in a 600-ton oval-shaped mixer. Other metals may also be placed in the mixer. At the proper time, the mixer is tipped. Hot metal pours from a spout at the top into the charging ladle. This ladle holds from ten to twenty-five tons



MAKING BESSEMER STEEL BY THE BESSEMER PROCESS

of hot metal. It is picked up by a huge crane and swung to a position over the converter.

The Bessemer converter itself is tube shaped. It may be about twice as long as it is wide. The opening, or



The Door of an Electric Furnace Is Raised as steelworkers stand ready to shovel alloy materials into the fiery opening.

U.S. Steel Corporation

Various ingredients are added to make different kinds of steel, just as in preparing different kinds of foods.

nose, of the converter is placed at the top and slightly off center. The bottom of the converter is pierced by nozzles, called tuyères. Beneath the tuyères is a round steel plate box called the *wind box*. Compressed air is forced into this box and flows up through the tuyères into the steel. The converter is set on two supports so that it can be turned in a complete circle. It is lined with a glass-like material called *mica schist*, which contains a great deal of silicon.

When it is time for the metal to be poured into it, the converter is swung around to a position parallel to the ground, or horizontal. An iron trough, or *runner*, is swung into the nose. The iron from the ladle car is then poured along the runner into the converter. Then the runner is removed. The converter is now raised to an almost straight up and down, or vertical, position, and air is allowed to blow into the molten metal for ten to fifteen minutes under pressure of about twenty pounds per square inch. This period is called the *blow*. The oxygen in the air burns the pig iron which it first strikes. This flame passes swiftly through the churning mass of metal and comes out at the nose of the converter.

At this stage of operation, the silicon and manganese in the metal unite with oxygen to form silicon dioxide and manganese oxide. Neither silicon nor manganese oxides will dissolve in metal, so they form a slag. When silicon, manganese, or iron combine with oxygen, they form a great heat which raises the temperature of the remaining metal even higher. This causes the flame coming from the nose of the converter to be red. Now the carbon in the mixture begins to burn, setting up a roaring boil in the liquid metal. Now, about one and one-half tons of cold scrap iron are added to the mixture to keep it from getting too hot. The carbon burns briefly with a bright yellow flame. Then it begins to die down. This is the signal for the operators to turn the converter on its side and stop the blasts of air through the tuyères.

The steel within the converter is now practically free of silicon, manganese, and carbon, but it contains many harmful gases. So molten pure pig iron, containing 20 per cent manganese is mixed in. This iron is called spiegel iron. The manganese soaks up all the oxygen of the gases, and in about twenty minutes, the steel is quite pure, except for about 4 per cent manganese which it has absorbed. This small percentage of manganese is considered desirable because it toughens the metal, so the steel is ready to be poured into molds. It is poured from the converter into a ladle, which swings around and pours the molten steel into molds. When the steel is cool, it is taken to machines, called *strippers*, which remove the molds.

In the United States, the Bessemer process works on the principle that the silicon in the wall of the converter will combine with oxygen. This oxide is considered acid. So the process is called an acid process. An acid process will not remove sulfur or phosphorus, however. Therefore, iron ore which contains a high percentage of these elements cannot be converted by this method.

In Germany, where iron has a high sulfur and phosphorus content, a *Thomas converter* is used. The Thomas converter has a lining of lime or magnesite. The lime reacts with the sulfur and phosphorus to form a slag, while the magnesite reacts to rid the iron ore of carbon, manganese and silicon.

Open-Hearth Steel is made in extremely large rectangular furnaces with hearths which may hold from fifteen to 350 tons of molten steel. Two checker chambers stand on either side and underneath one end of the furnace. The furnace itself is built of silica brick held together by large steel columns and stays. A large pan made of riveted steel plate forms the bottom of the furnace, and a thick covering of magnesite brick is built over the steel

plate. Over this is another covering of double-burned magnesite. On one side of the furnace are doors where the charge is loaded in. This is called the *charging side*, or *floor side*. On the opposite side of the furnace is the *pit*, or *tapping, side*. This is where the molten steel is removed. To charge an open-hearth furnace, molten pig iron, limestone, and steel scrap are brought in on the floor side in charging boxes mounted on cars called *buggies*. A large crane then picks up each charging box, turns it, and dumps the contents into the furnace. Charges of limestone are placed in the furnace first. Pig iron is loaded second, and scrap iron is placed on top. If the pig iron is very hot, however, the limestone is loaded first, and the scrap second. The charge is then melted down before the hot pig iron is loaded into the furnace. After loading the furnace, the charge is gradually brought to a molten condition. The heat is supplied by gas and air which come from the checker chambers. The fuel and air meet at the end of the furnace and burst into flame which passes into the furnace through ports placed above the charge. Gases pass out at the other end through uptake pipes and are brought back to the checker chambers. This operation is very similar to the operation of the checker chambers in a crucible furnace.

After the charge is melted, the lime at the bottom begins to work up through the steel to form a calcium-silicate slag on the top. At the same time, it removes a portion of the sulfur and almost all the phosphorus in the charge. The high heat is continued until the furnace operator, called the *melter*, decides the steel is ready for tapping. As in the Bessemer process, spiegel iron is added to take away harmful gases and to add manganese content to the steel. Then the ladle is placed under the spout of the taphole and the taphole is opened. The ladle is equipped with a small spout. The slag which runs out through the taphole along with the steel skims off through this spout into a large container, which is called a *thimble*, because of its shape. The ladle is picked up by a huge ladle crane which can carry a load of about 200 tons. The steel is then poured into molds.

Acid Open-Hearth Process. The furnace for this process is constructed like the furnace for making basic open-hearth steel. The only difference is that the furnace bottom is built of silica brick and silica sand which has been *fired*, or *sintered*. That is, the silica sand has been heated to a point where it fuses together slightly, but does not melt entirely. Acid open-hearth furnaces are usually smaller than other open-hearth furnaces. They are used mostly in foundries where steel castings are made. The furnace is charged in the same way as a basic open-hearth furnace except that the limestone is left out. The pig iron is placed on the bottom and scrap is charged on top. The best scrap iron and pig iron must be used in this process, since the acid process will not remove sulfur and phosphorus. The acid open-hearth process removes about the same impurities as the Bessemer process does—manganese, carbon, and silicon.

Soaking Pit. Steel mills have soaking pits which keep ingots hot from the time they are taken from their molds until they are ready to be rolled. The pit is square in shape, made of brick, and kept warm by checker chambers similiar to those of an open-hearth furnace. On top of the pit there is an arched cover which rolls aside as the ingots are loaded into it. The average soaking pit contains from two to six ingots standing on end. After the liquid ingots have become solid in their molds, the molds are removed by the stripper, and the ingots are dropped into the pit. At this stage of the process, the steel on the outside of the ingots is red hot, while the steel inside the ingots is white hot. The pit is kept at a temperature high enough to bring the entire ingot up to white-hot heat.

Rolling Mills. The ingots which come from the soaking pits are not in usable form. They are generally thick squares or oblongs of molten metal which must be pressed into uniformity and shaped before they can be used. Rolling mills take care of this need. Every steel rolling mill contains a succession of rollers. The first of the rollers is generally very heavy and powerful. Each roller is grooved in the shape of the desired article. The rollers are so arranged that each time the steel is passed through another roller, it becomes smaller and closer to the required final shape. Some of the rollers, called *blooming mills*, which do the very heavy first work on steel, have screw-down attachments. This means that the roller can be lowered so that it presses the article smaller each time it is passed through. Many different kinds of steel rolling mills are used, depending on the article which is to be made. Many of them have equipment for stamping and hammering as well as for rolling. Among the different kinds of rolling mills are plate mills, and rail mills.

Rail Mills. Ingots which are to be shaped into railroad rails are heated white hot and rolled in blooming mills until the rail is about four inches high by two inches across. Most of the steel ingots have hollow places, or *pipes*, in the top because liquid steel becomes smaller, or *contracts*, as it hardens. Since the sides of the ingot become cooler first, they usually harden in the shape of the mold. Then the white-hot steel inside the mold begins to cool and pull away from the top of the mold, leaving a hollow space, or *pipe*, at the top of the mold.

To make sure that the rail contains no hollow spaces which would weaken it, *guillotine shears* are used to trim the ends away. These shears are operated by hydraulic power and are called *guillotine* because they look somewhat like the beheading machines which are used for executing criminals in France. The shears also cut the rails into lengths called *billets* which will make one to two rails of standard length.

The billets are reheated and run through rollers which are grooved so that the top and bottom sections of the rail fall into the grooves and are not rolled out so thin as the center of the rail. The rails are passed through these rollers fifteen times before they are finished. The final operation in making rails is the punching of holes in the bottom, or *flange*, of the rails so that they may be spiked down. Many structural steel shapes are made in the same way as railroad rails. Among these are I beams, channels, and angles. Extra-heavy equipment is required to make H beams, but the process is the same as in making rails.

Carburization. This process consists of adding carbon to the outer edge of steel shapes to form a hard shell around the softer steel. It is also called *casehardening*. The carbon is added by bringing the steel object in con-

Iron Age

White-hot Steel Lights up the Night as it flows from a towering blast furnace. The furnace has just been opened, or tapped. The liquid metal flows through open ditches called runners and into ladle buckets that will be moved by cranes.

tact with a solid, liquid, or gas which contains carbon. Then it is heated to a temperature about 1600° F. to 1800° F.

Pack carburizing is the oldest way of adding carbon to steel. It consists of placing the steel in a sealed container, along with a form of pure, or *free*, carbon, to which a metal and carbon compound has been added. The whole mass is heated, causing the metal and carbon compound, called a *metallic carbonate*, to break up into different chemical compounds. One of these is *carbon dioxide gas*. The tiny molecules which make up this gas each contain one atom of carbon and two atoms of oxygen. When the carbon dioxide touches the free carbon in the pack, the two oxygen atoms in the gas molecules split. One leaves the carbon dioxide molecule to combine with an atom of free carbon and make molecules of *carbon monoxide gas*. Such molecules contain one atom of oxygen and one atom of carbon. The heat has caused the outer edge of the steel object to expand slightly. This means that the molecules in the object have drawn a little apart from each other, leaving spaces for the carbon monoxide gas to creep in. This process is called *diffusion*. The carbon in the gas combines with the steel, and the oxygen passes off as gas, leaving the case harder than the steel inside.

Liquid carburizing is used to make steel where a thin case is desired. For cases thicker than one three-hundredths of an inch, other methods are used. The liquid which is used to carburize the iron is usually a carbon and oxygen compound, called a *carburizing salt*, which has been melted, or *fused*. The carburizing salt usually is a compound of cyanogen and calcium or sodium and oxygen. Chemists call such a compound cyanide. When the steel is dropped into the fused cyanide and the temperature is raised, the cyanogen begins to break up. Cyanogen molecules are made up of two atoms of oxygen combined with two atoms of carbon. They break up into new molecules containing one carbon and one oxygen atom each. This compound is carbon monoxide gas. It diffuses into the steel in the same way as it does in pack carburizing.

Gas carburizing is a method similar to the pack carburizing, except that gas instead of solids is placed in the sealed container with the steel. Gases used for this system of carburizing usually contain both hydrogen and carbon. Such gases are called *hydrocarbons*, and include methane, ethane, propane, and butane. The carbon atoms leave the gas and diffuse through the iron to form the case hardening.

Iron and Steel Alloys

Other elements must be mixed with the steel to attain different properties of strength, chemical resistance, or softness. Usually these elements are iron, combined with varying amounts of tungsten, vanadium, chromium, nickel, zirconium, titanium, molybdenum, uranium, columbium, copper, manganese, silicon, and lead. For instance, a mixture, or *alloy*, of iron with large amounts of nickel and chromium makes a steel which is very resistant to rust in the hot zones of furnaces. Such irons are cast, and they have greater strength and resistance to wear. The motor blocks of nearly all internal-combustion engines are made from this type of metal.

Steels alloyed with chromium and copper and containing a great deal of phosphorus weigh only about one third as much as old-type steels. These steels are much used in making lightweight streamlined trains. Lead is added to steels which are to be subjected to swift and repeated machining. Such steels are called *screwstocks*. The lead is not mixed with the steel, but exists as a separate metal in the steel. Stainless steels are another example of steel alloys which resist corrosion. They are made usually in an electric furnace, and contain chromium and nickel. The most widely known stainless steel contains 18 per cent chromium and 8 per cent nickel. Steelmakers call it 18-8 steel.

Uses of Steel

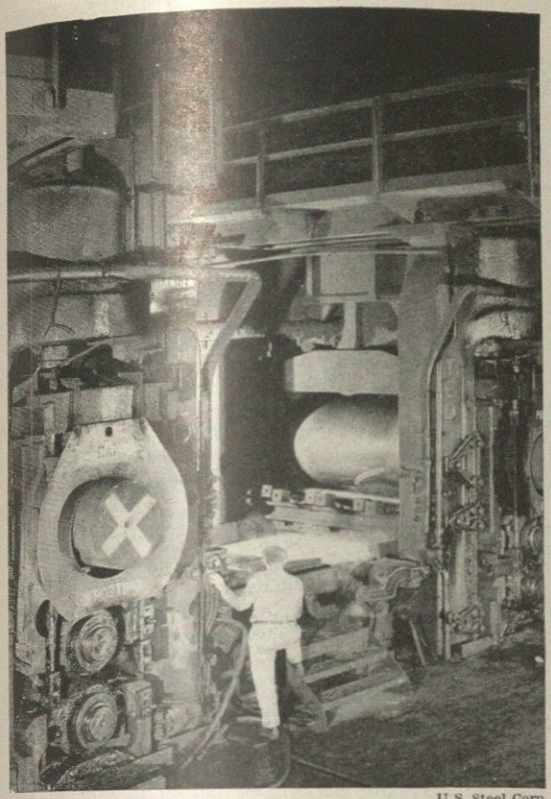
Steel is used everywhere that great strength or resistance to chemical reaction is needed. It is made into wire which in turn is spun into large cables. These cables hold up the long suspension bridges which are one of the marvels of our age. The metal is made into many different kinds of beams to support tall buildings. It is also made into other structural shapes such as channels and angles. Stainless steel in particular is used to make kettles, pans, knives, forks, and spoons, for use in the home. Other common uses of steel are in engines, as armor on warships, and to make the framework of railroad cars and automobiles. Steel has been worked into fibers fine enough that sheer hosiery could be woven from it.

History of Iron and Steel

We do not know when iron was first discovered. But a piece of iron in the British Museum is thought to have been made six thousand years ago by the Egyptians. The Assyrians were probably the first people to become skilled workers in the metal, however. They are generally credited with starting the Iron Age. The Assyrians had iron chariots and beautifully made ornaments for their harnesses. They had iron swords and tools, and their saws and files were much like the ones we use today. They also knew how to make steel. During the Crusades, the Assyrians became famous for their steel swords. Saladin, a Turkish ruler, had a steel sword sharp enough to cut through a feather pillow at one blow. Only six hundred years ago, iron pots and pans were considered extremely valuable. See ANCIENT CIVILIZATION (Materials); ASIA MINOR.

In early times iron was separated from its ore in a very simple way. It was put in a hot fire of charcoal, and the iron melted and trickled out to form a lump of metal. Ironmakers soon discovered that the hotter the blast, the better the metal. So they blew on the fire through a hollow cane or tube. Then different kinds of bellows were made to force air into the fire.

The Spanish ironworkers of Catalonia built a better kind of furnace. The air was forced in by huge bellows which operated by hand or by water power. This Catalan forge was used by ironworkers through the Middle Ages. The demand for iron and steel became so great that larger and larger furnaces were built. More powerful air currents were forced through the fire. Coal and coke were used instead of wood and charcoal. By the time America was discovered, iron and steel making was



U.S. Steel Corp.

Steel That Goes Down to the Sea in Ships is being reduced in width to 87 inches. This high-strength plate metal will be used to cover the sides of an ocean-going vessel.

already a thriving trade. English settlers set up the first ironworks in America at Falling Creek, Va., in 1619. It was operated by the Virginia Company and stayed in business until 1624 in spite of Indian attacks. The next ironworks of this country was established at Lynn, Mass., on the Saugus River in 1643. John Winthrop, Jr., operated the works with other men who called themselves the *Company of Undertakers for the Iron Works.*

In 1740 an Englishman, Benjamin Huntsman, discovered a way to make uniform steel from blister steel. His method opened the way to the crucible process of making fine steel.

The first iron rolling mill to puddle iron and roll iron bars was built by Isaac Meason in 1816 at Plumpsock, Pa. Later many more rolling mills sprang up. Then, in 1856, Sir Henry Bessemer, an Englishman, built the first Bessemer converter. This discovery, combined with the need for good steel for railroads, opened the Age of Steel.

Vocational Opportunities

There are many opportunities for young men—and even young women—in the iron and steel industries. There are jobs for *chemists* who conduct research in an effort to find new ways of alloying steels and irons to make stronger and better metals.

There are great opportunities as *engineers* to devise new methods for heating and making the steel, or for laying out the arrangement of the furnaces and rolling mills to achieve greater efficiency.

Engineers of a rolling mill in Pennsylvania figured out a system for laying out the mill so that only about five men were required to operate the entire gigantic plant. The industry offers many other jobs as crane operators, melters, furnace operators, roller operators, miners, and foundry workmen.

There are entire firms of iron and steel brokers, who buy iron and steel from the mills and sell it to manufacturers and builders. All the mills and brokers have *salesmen* who must be familiar with the qualities of different irons and steels in order to advise and sell to manufacturers and builders.

H.McC.

Related Subjects. The reader is also referred to:

Ambridge, Pa.
Bessemer, Henry, Sir
Bethlehem Steel Corporation
Bridge
Carbon
Carnegie, Andrew
Casting
Colonial Life in America (Ironmaking)
Ductility
Foundry
Galvanized Iron
Gary, Ind.
Industrial Revolution (The Iron Industry)
Iron Age
Mesabi Range
Nails
Ore
Republic Steel Company
Smelting
Tempering
United States Steel Corporation

Outline

I. Introduction
II. Iron Ore
- A. Properties
- B. How Iron is Formed
- C. Kinds of Iron Ore
- D. Sources of Iron
- E. How Iron Is Mined

III. How Iron Is Made
- A. The Blast Furnace
- B. Pig Iron
- C. Cast Iron
- D. Wrought Iron

IV. Uses of Iron
V. How Steel Is Made
- A. Blister Steel
- B. Crucible Steel
- C. Electric-Furnace Steel
- D. Bessemer Steel
- E. Open-Hearth Steel
- F. Acid Open-Hearth Process
- G. Soaking Pit
- H. Rolling Mills
- I. Carburization

VI. Iron and Steel Alloys
VII. Uses of Steel
VIII. History of Iron and Steel
IX. Vocational Opportunities

Questions

How do scientists think iron was formed?

From where does the purest iron in the world come?

What is bog iron? How is it mined?

What is open-pit mining? Opencut mining?

What is meant by the *charge*? A *scale car*? A *skip car*?

What is slag? How is it removed from the blast furnace?

What is pig iron? For what is it chiefly used?

What is blister steel? Why is it not a high-quality steel?

Why is an electric furnace placed on rockers?

What people probably began the Iron Age of history?

When was the first ironworks established in America? The first rolling mill?

IRON CHANCELLOR. See BISMARCK-SCHÖNHAUSEN.

IRON CITY. See PITTSBURGH (Pa.).

IRON CROSS. See DECORATIONS AND MEDALS (Germany).

IRON CROWN OF LOMBARDY. See CROWN; ITALY (Government and History [Middle Ages]).

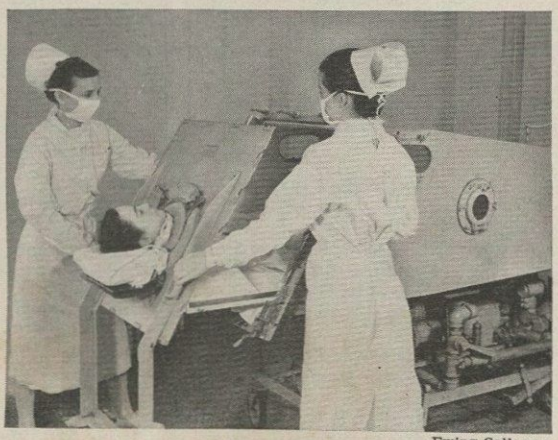
IRON GATE. See DANUBE RIVER.

IRON LUNG is a device which is used to treat paralysis of the muscles and organs of breathing. It is sometimes called a respirator. In cases of paralysis the chest loses its normal muscle action, and the person is in danger of dying from slow suffocation, because he cannot get enough air into his lungs. The iron lung makes it possible for the patient to breathe normally.

Ewing Galloway

A Portable Type of Iron Lung, or Respirator. The portable type is preferable to the tank type in suitable cases, since it is much more convenient and allows the patient more freedom.

The iron lung is a large metal tank with an attached pump that changes the amount and pressure of the air within the tank. The patient lies in the iron lung with only his head outside. A rubber collar at the neck keeps air from escaping. Fifteen to thirty times each minute the pump withdraws air from the tank, the patient's chest is raised, and air enters his nose and mouth just as it would naturally. Then air is allowed to flow back into the tank, the chest is lowered, and the patient exhales. This process has been carried on for hours, and even for several years in certain cases. It has been successful in carrying many people who suffer from infantile paralysis over the severe period of the disease. Multiple respirators, in which four patients can be treated at the same time, have sometimes been used.



Ewing Galloway

Placing a Patient in an Iron Lung of the Tank Type. When closed, this type of iron lung becomes a sealed chamber in which the air pressure is regularly increased and reduced.

The iron lung was developed in 1928 by Philip Drinker and Louis A. Shaw at the Harvard School of Public Health in Boston. In 1937 Dr. Bo Sahlin developed an iron lung which has no tank. The Sahlin iron lung is a breastplate shaped like a dome. This device is attached to the chest and connected with a pump. W.W.B.

IRON MASK, MAN IN THE, was the name popularly given to a famous prisoner in the Bastille in Paris. The prisoner always wore a mask during the years he was held in the Bastille and other French prisons. His identity was a closely guarded secret. He is believed to have been Count Mattioli (1640-1703). Mattioli was an Italian statesman who served as secretary of state to Charles III and Charles IV, rulers of Spain and certain provinces in Italy. Mattioli is believed to have revealed the details of secret negotiations for the sale of the fortress of Mantua, Italy, to France, and was imprisoned in 1698 for his treachery. He died in prison. There are several other versions of the story of the man in the iron mask.

IRON MOUNTAIN. This hill in the Saint François (or St. Francis) Mountains of southeastern Missouri was named for its large deposits of high-grade iron ore. The mountain also contains porphyry, a hard purple-tinted stone which takes a high polish and is used for ornaments. Iron Mountain is 1,078 feet above sea level, but the peak lies in a high region and is only 300 feet above the surrounding country. The slopes of the mountain are covered with oak forests. The highest elevation in Missouri, 1,772 feet above sea level, is near by. L.D.,JR.

IRONSIDES is a name that was given to Oliver Cromwell's army. The soldiers were said to have shown iron courage at the Battle of Marston Moor in 1644.

IRONSIDES, OLD. See CONSTITUTION, THE.

IRONWOOD, or **HORNBEAM.** These names are given to certain trees that have exceptionally hard wood. In North America two well-known species belonging to the birch family are included in this group. One of these is the *hop hornbeam*, or *ironwood*, a small forest tree that grows throughout the United States east of the Rocky Mountains. The trees usually grow singly in the woods. The slender trunks grow from twenty-five to fifty feet tall, and have grayish, flaky bark. The leaves look like birch leaves, and the fruit clusters look like hops. The wood of the hop hornbeam is so hard that lumberjacks have used the trunks of the trees as levers. It is one of the best materials for tool handles and small implements. Pieces that are free from knots are good for making bows.

The other species is called *American hornbeam*, *blue beech*, and *water beech*. It is common in moist places east of the Rocky Mountains. Its bark is smooth except on some old trees. It has a texture like that of beech bark, but its color is blue-gray. The slender trunks are bumpy and swollen in ridges under the close-fitting bark. These trees seldom grow more than twenty feet tall. Their

Brownell

Fruit of This Ironwood, or Hornbeam, Tree is so much like hops in appearance that the species is called the hop hornbeam. The large shiny leaves have edges like saw teeth.

crooked branches bend easily, and people sometimes weave them together to make arbor walks in parks and gardens. The wood is very hard and strong, like that of the hop hornbeam. In some parts of the United States, the name ironwood is also used in referring to the basswood tree. W.M.Har.

Classification. The ironwoods belong to the family *Betulaceae*. The hop hornbeam is *Ostrya virginiana*. The American hornbeam is *Carpinus caroliniana*.

IRONWORKER. See Building Trade (Vocational Opportunities).

IRON WORKERS, INTERNATIONAL ASSOCIATION OF. See International Association of Bridge and Structural Iron Workers.

IRONY. A displeased mother may say to her young son in a certain tone of voice, "You certainly are a nice boy." He understands at once that she really means the opposite of what she says. She has passed her meaning on to him in an indirect way. This is called *irony*, from a Greek word which means *to cover up* or *to hide*. It is a very powerful figure of speech, often used in accusing someone. In his speech over Caesar's body, Anthony refers several times to the "honorable" men whose daggers have stabbed Caesar. He really meant they were dishonorable. By his ironical use of *honorable* he stirs up his hearers to a frenzy. The irony of Job is kindly rather than bitter when he can no longer endure his friends. He says, "No doubt but ye are the people and wisdom will die with you."

When events turn out unpleasantly opposite from expectations we call it "the irony of fate." T.C.L.

See also Humor (Types of Humor).

IROQUOIAN, *IHR oh KWOY an*. See Indian, American (Languages, Signs and Signals; Tables of Tribes).

IROQUOIS, *IHR oh quoy*. See Five Nations; Indian, American (Eastern Woodsmen; Table of Tribes).

IRRADIATION, *ih RAY dih A shun*. See Food Preservation (Canning Milk).

IRRAWADDY, or **IRAWADI,** *ihr ah WAH dih*, **RIVER.** This is the chief river of Burma. It flows about 1,500 miles southward through some of the most colorful scenery in the country. The Irrawaddy rises in a high rocky region in northern Burma. It flows through a thickly populated area down to the broad rice fields of the coast. Here the river enters the Bay of Bengal through many mouths that form a delta of rich farm land.

The banks of the river have been diked for about 100 miles inland to protect the countryside from floods. The city of Rangoon lies on the eastern delta but is not on the Irrawaddy itself. Small steamers can sail up to Bhamo, which is 600 miles inland. G.B.Cr.

IRREDENTISM, *IHR ee DEN tiz'm*. See Italy (Government and History [Modern Kingdom]).

IRRIGATION, *IHR ih GAY shun*, is the watering of plants by artificial means. The sprinkling of lawns and home gardens and the watering of potted plants are examples of irrigation on a small scale. The kind of irrigation that is most important to man, however, is supplying water to farm crops.

Without irrigation there could be no farming in dry regions. Millions of acres of rich land which are now covered with productive farms and which support prosperous communities would still be wasteland and desert, a land of cactus and sagebrush, coyotes and jack rabbits.

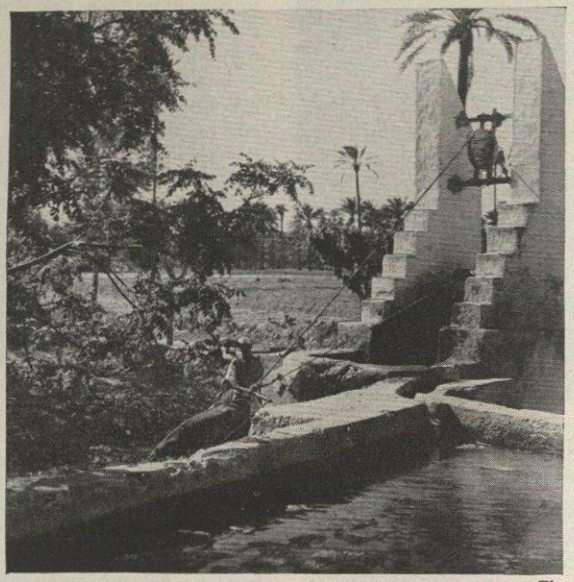
Ewing Galloway

Man Power Pumps Water for Irrigation in Japan. Here a Japanese farmer and his wife push a simple but effective paddle wheel that lifts water from a stream to the rice paddies.

Irrigation has been practiced in simple ways for thousands of years by peoples in many parts of the world. But only since the late 1800's has man applied scientific knowledge to watering dry waste places so that they become fertile land.

Different plants need different amounts of water for life. But all kinds of plants require some water for life and growth. Irrigation is necessary if water does not come to them in the proper amount and during the proper seasons in the form of rain or of water seeping through the soil. As a rule, land that receives less than ten inches of rain a year will not produce crops of any sort without regular and plentiful irrigation.

Where the rainfall is between ten and twenty inches a year, certain crops can be grown without irrigation if dry-farming methods are used. (See DRY FARMING.) But the yield of crops from dry farming is low and uncertain. Periods of drouth often occur even in regions where the total yearly rainfall is ample. In other places, there is enough rainfall, but the distribution of rain during the growing seasons is irregular and unsatisfactory for plant growth. This is true in regions where most of the rain falls during the winter, and the summers are dry. In all these cases, irrigation is beneficial because water can be supplied whenever the crops need it. The results of irrigation are greater productivity of the land, fewer crop failures, and more prosperous communities in regions that once were barren.



Pix

Irrigation in the Deserts of Libya is very ancient. At this well, an ox lifts a goatskin of water from the well by a rope and pulley. When the skin reaches the pulley it dumps the water, which runs into the big stone storage tank.

How Water Reaches the Crops

In general, water for irrigation is taken from the most convenient and dependable source available. A hillside spring often supplies the water for a farmer's vegetable garden or home orchard. In large-scale irrigation by means of dams and canals, water is led from rivers and streams to farms that may be hundreds of miles away. Dams are built to hold back water in great artificial lakes called reservoirs. This is water that otherwise would run off the land and be lost in so far as its value to farm crops is concerned. Much water for irrigation is pumped from wells which tap the great supplies of *ground water* that lie beneath the soil. About one out of every three acres of irrigated land in the United States receives its water from underground sources. The energy for pumping this water is supplied by windmills, gasoline engines, and electric motors.

Most of the water distributed to farm lands in the United States and Canada is run on to the farms through open ditches. The main ditch, or canal, takes water from the source of supply. Smaller ditches, *erals*, leave the main ditch at regular places the water to the fields. Special gates, called h regulate the flow of water into the laterals a off when it is not needed.

The method by which water is distribute lands is determined largely by the crop. Fields wheat, and other grains usually are flooded portable dam, made of a canvas-covered me or of a sheet of galvanized iron, is placed ditch to divert the water. This floods a small a field. The dam is then moved and the pro peated until the entire field is flooded. Crops planted in rows small fruits, potat toes, corn, and b ally are irrigated ning the water ditches between

For the best r main irrigatio should be lined crete to prevent water by seepag the ground. See only means a was able water, but increases irrigat greatly.

In some cases distributed throu concrete pipes i open ditches. Th have spaced which can be op closed by metal v other way in wh can be brought to fields is by galva pipes that are la the ground in sec can be connected easily while water is flowin them. Whenever the watering of one plot is c and another is to be irrigated, new sectio slipped onto the ends of the pipes already lin

Preparation of the Land

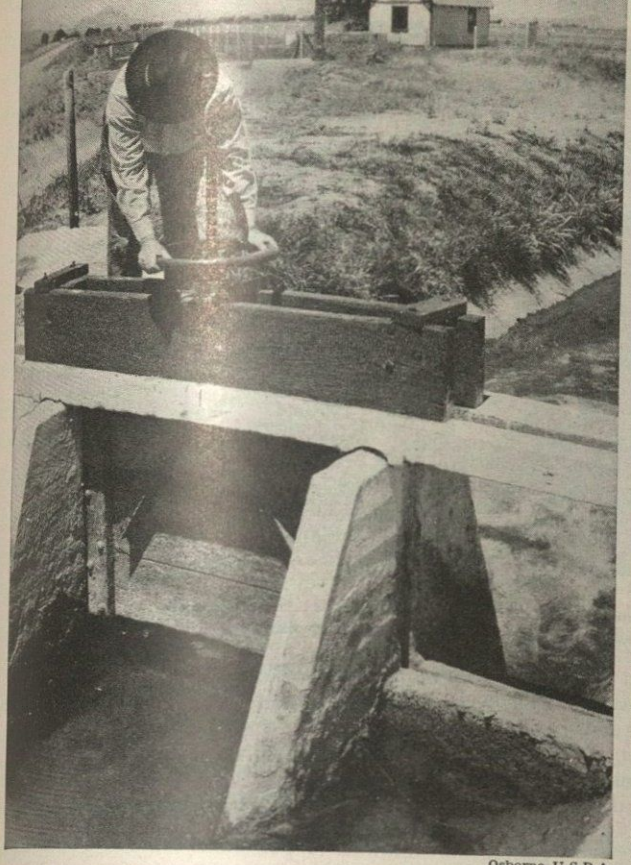
Whatever the method of irrigation, the lan graded or leveled before the crops are plan leveling is necessary so that the water smoothly and evenly over the land. A slope o to twenty feet to the mile will allow the wat freely, yet slowly enough so that it will not soil away. This is usually all the preparation need for irrigation in the furrows of crops p rows. Land that slopes more steeply must be further to hold irrigation water. This is done w which are small level plots surrounded by low hold in the water. Another device is the use which are long curving plots bounded by ri run crosswise of the slope of the land. Both methods not only hold the water, but also erosion, or the carrying away of topsoil.

ches, called *lat-*
places and take
lled head gates,
rals and shut it

ributed to farm
Fields of alfalfa,
ooded. A small
ed metal frame
aced across the
mall area of the
e process is re-
Crops which are
rows, such as
potatoes, toma-
and beets, usu-
igated by run-
water in small
ween the rows.
best results, the
gation canals
lined with con-
vent the loss of
eepage through
l. Seepage not
a waste of valu-
, but it often
rrigation costs

cases, water is
through buried
pes instead of
es. These pipes
ced openings
be opened and
etal valves. An-
n which water
ght to irrigated
galvanized iron
are laid above
in sections that
lowing through
t is completed,
ections can be
dy linked.

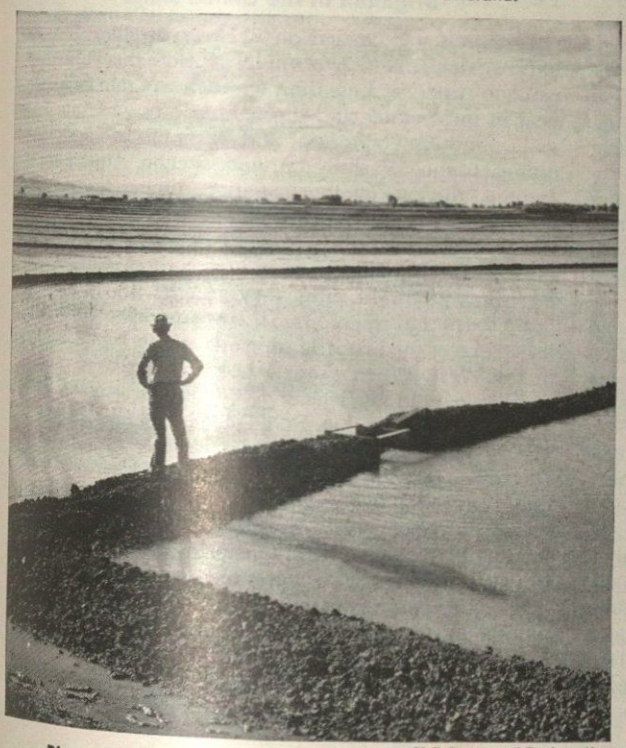
e land must be
planted. This
ater will flow
ope of from ten
e water to flow
not waste the
ation land will
ops planted in
st be prepared
one with *checks*,
y low ridges to
use of *terraces*,
by ridges that
Both of these
t also prevent



Osborne, U.S.D.A.

The Desert Blooms as water rushes through an irrigation canal gate on its way to farms in former wasteland.

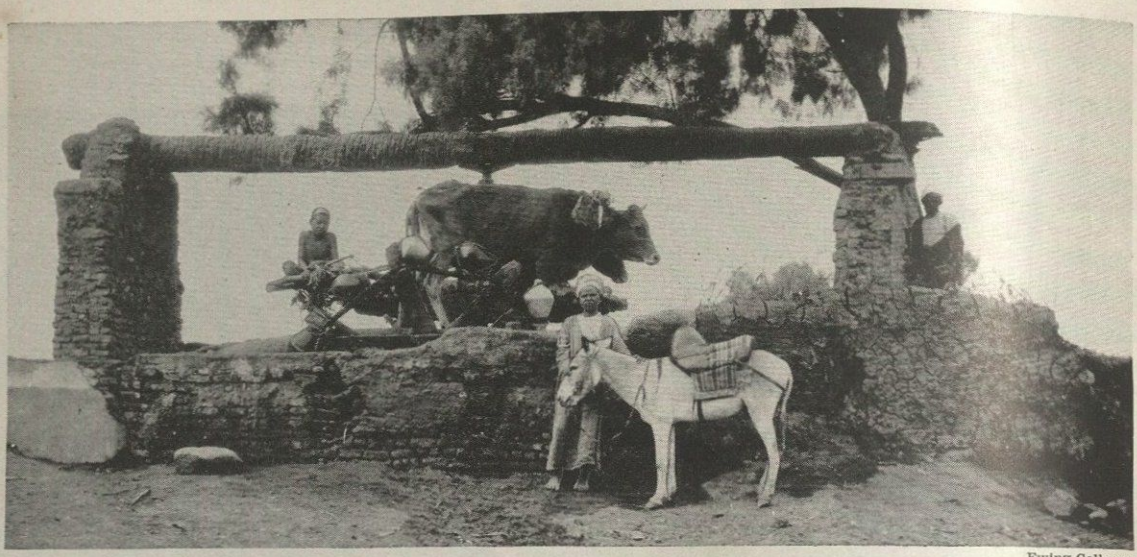
Life-giving Water Bubble
Southern California and turns



U.S. Bureau of Reclamation

Rice Fields in the Sacramento Valley of California are flooded, and young rice shoots push up above the water.

The Madera Irrigation Can
farms past the stony cliffs of t



Ewing Galloway

This Ancient Ox Pump Still Operates in Egypt. Water is just a few feet below the surface in the fertile Nile Valley. This crude bucket wheel dips it up as a boy drives his oxen in a circle to provide power for the ancient machine.

Crops, such as strawberries, that are planted on raised beds, are irrigated by water in ditches between the beds. The water soaks into the sides of the beds and reaches the plant roots from below. With this method, the top of the bed remains dry. This reduces the spoiling of the fruit by mildew and rot. Such irrigation is called *underbed irrigation.*

Irrigation and Conservation

Scientific irrigation is among the chief phases of conservation. Irrigation uses soil and water resources in a way that contributes most to human welfare. With proper irrigation practices, soils yield larger and better crops. Water that falls on land unsuited for farming, or that otherwise would run off the land without being used, is carried to areas where the soil is good, but where the water supply is inadequate. Where the yearly rainfall is ample, but all comes in a short season, the water can be stored for use in the long dry season that follows.

A much greater variety of crops can be grown with irrigation than without it. These crops include orchard fruits and nuts, small fruits and berries, vegetables, sugar beets, flax, cotton, rice, and many field, hay, and pasture crops. Irrigation reduces the number of crop failures from drouth and other causes, and makes a higher standard of living possible in the particular region. Wherever irrigation has been introduced, farm values have increased, better schools and churches have grown up, more recreational opportunities have been provided, and community welfare has been increased generally.

The best results are obtained from irrigation only if the water resources are used wisely. Water is available for less than one out of every ten acres of land suitable for irrigation in the dry regions of the United States. Only the better lands, therefore, should be irrigated. Many soils contain too much alkali to produce good crops. Other soils do not contain enough minerals or are too stony for good crops. Such soils are called *submarginal soils.* It is foolish to irrigate submarginal soils when better soils are available.

Sometimes the water sources are plentiful, but are unsuited for irrigation because the water contains too much salt or alkaline mineral, or even chemicals that are poisonous to plants. If such waters are used for irrigation, the injurious or poisonous substances accumulate in the soil and make it worthless for farming.

Irrigation in the United States

Irrigation was carried on by town dwelling Indians of New Mexico and Arizona long before the white man came to America. Less than ten inches of rain falls each year in these states and throughout most of Utah, Nevada, southern California, and parts of Colorado, Wyoming, Idaho, Washington, and Oregon. Among these Indians, the care of the irrigation ditches was a community responsibility in which everyone shared.

The Spaniards who came to America knew something of the irrigation system which the Moors had established in Spain, and they taught the Indians to build dams and reservoirs. In 1847 the Mormons established one of the first irrigation systems for white farmers in the West. When pioneer gold seekers were mining California gold by washing it from the stream beds, many ditches were dug. Some of these ditches afterward proved valuable as irrigation ditches. Until the late 1800's, there were only a few thousand acres of land under irrigation in the United States.

In 1894 Congress adopted the Carey Act, which granted land to states and territories which would build irrigation systems. Few states or territories took advantage of this act, however, and in 1902 a Federal Reclamation Act gave the United States Department of the Interior the power to construct irrigation systems with funds obtained from the sale of public lands in the states mentioned in the Carey Act.

The states and territories covered by the act at the time of its passage were Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North and South Dakota, Utah, Washington, and Wyoming. Later, Texas was added. The Reclamation Service was created in the Department of the Interior to take over executive and financial details of irrigation-project construction. Since 1924 this division has been called the Bureau of Reclamation. This bureau has steadily increased its activities since that time. Bureau of Reclamation projects have been extended to Arkansas, Kansas, Louisiana, Missouri, Oklahoma, Oregon, and Tennessee. The total area under irrigation, including irrigation enterprises of all types, is more than 25,000,000 acres. The Bureau of Reclamation alone provides irrigation for about 6,000,000 acres of land.

The bureau has built some of the largest dams and reservoirs in the world. These include Boulder (Hoover) Dam, over the Colorado River, the highest dam in the world (726 feet). Lake Mead, its reservoir, is the largest in the world.

Engineers of the bureau have displayed the highest skill in constructing many of these projects. In mountain regions, concrete tunnels have been built to carry water from one level to another. A tunnel more than five miles long carries water to 200,000 acres of land near Gunnison, Colo. Water is sometimes carried across river beds and up and down mountain slopes by means of huge pipe siphons. A siphon 955 feet long carries water underneath the bed of the Colorado River to the Yuma irrigation project in Arizona.

Irrigation in Canada

Large areas of western Canada receive so little rainfall that it has been found necessary to irrigate them. Many of the Canadian irrigation systems are small, and have been built by private individuals or companies. The Dominion Government grants licenses to those who wish to develop irrigation systems and, in some instances, has assisted the development of these projects with loans of money.

One of the largest of the Canadian irrigation systems was constructed in the province of Alberta by the Canadian Pacific Railway. The water of the Bow River is caught in a reservoir near Bassano and diverted to about 500,000 acres of farm land. About the same amount of land is irrigated by water from the reservoir of the Horseshoe Bend Dam, which is situated on the Bow River near Calgary, Alberta.

Irrigation in Other Lands

For many years India has ranked first among the countries of the world in the amount of irrigated farm land. The crop failures and famine which have brought disaster to many millions in India have always followed periodical failures in the rainfall. After 1885 the British Government built many canals and water-storage projects in an effort to solve this problem with irrigation. The Indian peninsula as a whole, including the Dominion of India and the Dominion of Pakistan, has more than 50,000,000 acres of irrigated land.

The natives of Egypt have practiced irrigation for more than 4,000 years. At first they simply carried water from the Nile River in jars, or diverted it to the land through simple dams and canals. But these early irrigation systems depended entirely on the usual yearly flooding of the Nile. A year of low water meant famine. In order to provide constant irrigation, the British Government in 1902 completed construction of the great Aswan Dam to hold back and store flood waters that could be used during periods of drouth. The dam has been enlarged twice. It now has a storage capacity of 4,800,000,000 tons of water. About 7,000,000 acres of farm land in the Nile Valley have been made fertile.

Other countries with considerable areas of irrigated lands include the Soviet Union, France, Italy, Spain, China, Japan, Australia, Iraq, and Mexico. It has been estimated that more than 100,000,000 acres of land throughout the world require artificial watering. C.D.D.

See also AQUEDUCT; DAM (with list); DRY FARMING; RECLAMATION OF LAND; RESERVOIR.

Questions

About how much land is suitable for irrigation in the United States?

Have you ever done any irrigation? Explain.

Why may land need irrigation even where the yearly rainfall is plentiful?

Why must land be graded before irrigation? How much slope is desirable for irrigated land? Why?

What is meant by each of the following: (a) lateral? (b) check? (c) terrace? (d) underbed irrigation?

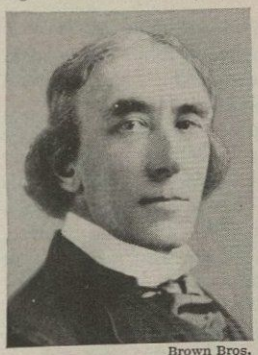
What are submarginal lands? Should they be irrigated? Why or why not?

Where in America did people irrigate hundreds of years ago?

What country in the world has the most irrigated land? Why is irrigation especially needed in that country?

IRRITANT. See POISON.

IRVING, HENRY, SIR (1838-1905), was the leading English actor of his time. In 1876 he took over the management of the Lyceum Theatre, London. For years Ellen Terry co-starred with him. They made many tours of the United States and Canada.



Brown Bros.

Henry Irving, an English clerk who became one of the greatest Shakespearean actors

Irving was born in Somerset. His name was originally John Henry Brodribb. He was a clerk in London for a time before he went on the stage. Queen Victoria made him a knight in 1895. B.M.

His Roles included leading parts in *The Bells; Eugene Aram; Hamlet; Macbeth; Richelieu; Richard III; Othello; Becket;* and *The Cup.*

IRVING, WASHINGTON (1783-1859), was the first American writer to gain fame abroad as well as at home. Readers today still enjoy his short stories and essays. They find in them a reflection of the author's own sense of humor, natural charm, and pleasant disposition. His characters, Rip Van Winkle and Ichabod Crane, bring chuckles to new generations of readers, while New Yorkers regard his Knickerbocker legends as an enjoyable part of local history.

Carefree Youth. Irving was born April 3, 1783, in New York City. His Scottish father had come there as a merchant a few years before the Revolutionary War. The boy was the eleventh and last child of the family. He was named for George Washington. His older brothers encouraged his interest in reading and writing. He loved poetry and books of travel, but disliked school, and left it when he was sixteen.

Chi. Hist. Soc.

Washington Irving, American author of the Knickerbocker Tales

Irving then entered a law office, but he took the study of law no more seriously than he had his school work. He preferred to ramble over the Sleepy Hollow region or to sail up the Hudson and Mohawk rivers. New York City at that time held less than twenty-five thousand people, and Irving often visited the near-by Dutch farmers.

Early Literary Career. In 1802 under the pen name of *Jonathan Oldstyle*, Irving wrote a series of letters for the New York *Morning Chronicle*. They were his first real literary work, and showed a style worthy of Joseph Addison.

His brothers sent Irving to Europe in 1804 because of his poor health. For two happy years he traveled in France, Italy, and England. He had several exciting adventures, met many famous people, and enjoyed the art, literature, and customs of Europe. In 1806 he returned to America, broader in knowledge, culture, and sympathies, as well as much improved in health. He was soon admitted to the bar, but never practiced law seriously.

In 1807 and 1808 Washington Irving, his brother William, and James K. Paulding published *Salmagundi*. This periodical carried essays and sketches in the manner of the *Spectator*, and was popular from the beginning.

At about this time, Irving's fiancee, Matilda Hoffman, died after a short illness. He felt her loss so deeply that he remained a bachelor all his life. To escape his grief, he put the finishing touches on *Knickerbocker's History of New York*. It was published under the name of Diedrich Knickerbocker, but it soon was no secret that Irving was the author of this mock-heroic story.

European Years. In 1810 Irving joined his brothers in the hardware business. Five years later he sailed for Liverpool, where he represented the family interests until the business failed in 1818. Irving then set to work to support himself by writing, and was even able to help support his brothers after his *Sketch Book* was published in 1820.

He had a wide circle of friends in England, and was invited to visit Sir Walter Scott. Scott's interest in folklore gave Irving his first desire to study American folklore. He recalled tales of his own Dutch New York, which he retold in the *Sketch Book* as "Rip Van Winkle" and the "Legend of Sleepy Hollow." Both tales are still read in schools as models of storytelling. In 1822, after a visit to France, he published *Bracebridge Hall*, which has been called an English version of his *Sketch Book*.

Irving published *Tales of a Traveler* after a visit to the Rhine country in 1824. An invitation from the United States Minister at Madrid to translate some Spanish documents took Irving to Spain when he was forty-three. During and after three busy years in that country, he published his *Life of Columbus*, *The Alhambra*, and *The Conquest of Granada*.

In 1829 he returned to England to serve as secretary of the American Legation. The Royal Society of Literature presented him with a gold medal, and Oxford University gave him the degree of LL.D.

Back to Sleepy Hollow. Irving returned to the United States in 1832, after seventeen years abroad. He was welcomed with enthusiasm as a successful American author. His real achievement was that he had interpreted a genial, hearty England to America. Both countries loved him for it.

Brown Bros.

The Return of Rip Van Winkle after his twenty-year sleep in the Catskill Mountains of New York. This well-known character was made famous by Irving in his "Sketch Book."

He purchased Sunnyside, an estate on the Hudson River near Sleepy Hollow. There he spent ten quiet years with his nieces. He refused offers of public office, and filled his time with writing, except for a trip to the Western prairies.

In 1842 Irving was appointed Minister to Spain, and served ably in this office for four years. He then returned gladly to Sunnyside, where he spent the rest of his life. In 1849 he published his delightfully sympathetic *Life of Goldsmith*. After some lesser works, he finished his well-balanced, impartial *Life of Washington*. Soon afterward Irving died, on November 28, 1859, and was buried near Sleepy Hollow. C.Me.

See also ALHAMBRA; KNICKERBOCKER, DIEDRICH; KNICKERBOCKER, FATHER; RIP VAN WINKLE.

IRVINGTON, N.J. (population 59,201). This industrial and residential center lies on the Elizabeth River about ten miles west of Newark. Factories here make machinery, knives, and toys. The city was a shipbuilding center in the 1700's. Irvington was first called Camp-

town, but the name was changed in 1852 to honor Washington Irving, the author and humorist, who often visited here. R.W.HAT.

IRWIN, WALLACE, and **WILLIAM HENRY,** are two brothers who became well known as writers. They were both born in Oneida, N.Y., and educated at Stanford University.

Wallace Irwin (1876-) became editor of the *Overland Monthly Magazine* in 1902. He won attention as a humorist with such writings in the magazine as "Love Sonnets of a Hoodlum." He also wrote *Venus in the East; Pilgrims into Folly; The Blooming Angel;* and other books.

"Will," William Henry, Irwin (1873-1948) was editor of *McClure's Magazine* (1906-1907), but left this work to spend his entire time in writing. He was a war correspondent in Europe in World War I. His works include *The City That Was; Old Chinatown; A Reporter at Armageddon; The Next War; Christ or Mars?;* and *Youth Rides West.* C.ME.

Brown Bros.

William H. Irwin, magazine editor and novelist

ISAAC, *I zahk,* was the son of Abraham and his wife Sarah in the Bible. Isaac is a much more shadowy figure than Abraham or Jacob. But a very beautiful and well-told story (Gen. 24) tells how Abraham sent his servant to the old home in Mesopotamia in order to get a wife from that place for his favorite son.

The servant reached the home of Abraham and came to a well about the time when the maidens came out to draw water. There he prayed for God to help him. He decided that he would select the one maiden who would not only offer him a drink from her pitcher, but would also offer to water the camels. He had no more than decided this when Rebecca, the niece of Abraham, came to the well. To his astonishment, she did exactly what he had asked for in his prayer. Then the happy servant went to the family of Rebecca. He got their consent to allow her to go to Palestine and become the wife of Isaac.

The story concludes with the meeting of Isaac and Rebecca. Rebecca was seated on a camel. She saw a man coming across the field, and asked the servant his name. He was Isaac. As he approached, Rebecca dismounted from the camel and covered herself with a veil, according to Oriental custom.

Another great story about Isaac tells of the trick played on him by his son Jacob in order to steal the blessing which Isaac had meant to give Esau (Gen. 27).

Ishmael was another son of Abraham. He was born to Abraham by Sarah's maid, Hagar. Isaac and Ishmael represent the traditional ancestors of the Hebrews and Arabs. The Hebrews recognized the Arabic tribe, or Ishmaelites, as the older one. But their interest was in their own ancestor, Isaac. They expressed their feeling of superiority by telling that the Arabs were descended from Abraham's slave girl. The Arabic stories about Abraham and Ishmael represent Ishmael as being the favorite as well as the older son of Abraham. Abraham himself is associated with the traditions of the Arabs, such as the founding of the chief sanctuary of Arabia at Mecca. W.A.I.

See also ABRAHAM; ISHMAEL; JACOB.

ISAACS, RUFUS DANIEL (1860-1935). See READING, RUFUS DANIEL ISAACS.

ISABELLA I (1451-1504) played one of the most important parts in the history of Spain. She was queen of Castile and Aragon. Her marriage to Ferdinand V of Aragon in 1469 united Spain's two largest kingdoms and laid the foundation of Spain's future greatness. The two rulers together made war on the Moors who

From the painting by Schopin

Isaac Presents Rebecca to His Father, Abraham. The young woman came from her home in Mesopotamia to become Isaac's wife. She had been chosen by one of Abraham's servants because of her kindness in giving water to his camels.

Chicago Historical Society

Isabella and Ferdinand Giving Audience to Columbus after His First Voyage to the New World

held part of southern Spain. In 1492 the Spaniards captured Granada and the Moors were removed from control. Isabella was one of the few persons who saw merit in the scheme of Christopher Columbus to find the Indies by sailing west. Her support of Columbus gave Spain the first foothold in America, thus leading to the growth of the Spanish Empire in the New World. See also CASTILE AND ARAGON (map); COLUMBUS, CHRISTOPHER; FERDINAND V; GRANADA. F.D.S.

Brown Bros.

Queen Isabella I, who worked to drive the Moors from Spain and make it a united Christian kingdom

ISAIAH, *eye ZA yah,* was a prophet of Judah and the first of the great Hebrew prophets. The word *Isaiah* is from the Hebrew language and means *salvation of the Lord.* Isaiah began his prophecies in "the year that King Uzziah died," (Isaiah 6), or about 750 B.C. His work is traced down to 701 B.C. Nothing is known of when or how he died.

The greater part of Isaiah's work as a prophet related to the danger from the Assyrians, who were then conquering all southwestern Asia. In 734 B.C. Syria and North Israel were planning to capture Jerusalem. The young king, Ahaz, asked the Assyrian king for aid. Isaiah had advised against this in his famous Emmanuel oracle (Isaiah 7:13-19). Ahaz soon learned his bitter error, when he came under control of the Assyrians. Twelve years later the Assyrians conquered North Israel. In 701 B.C. the Assyrian king, Sennacherib, swept into Judah, and attacked Jerusalem.

Isaiah looked upon these troubles as religious problems. Why did the Lord permit such wicked attacks and cruelty? Isaiah believed the Lord was using the Assyrians to punish His people for their sins. The people would be saved only if they repented. Isaiah is the prophet of faith: "By returning and rest shall ye be saved, and in quietness and confidence shall be your strength."

The Book of Isaiah in the Old Testament has sixty-six chapters and is one of the longest of the Bible. Modern scholars are agreed that it was written by a number of persons. Isaiah's sayings are found only in chapters 1 to 39. Chapters 40 to 55 are magnificent poems written about 550 B.C. They describe the power of God and His love for Israel. Their purpose was to rebuild the hope and faith of the Jewish exiles in Babylonia. Chapters 60 to 62 are fine poems foretelling the return of the Jewish people to Palestine. W.A.I.

ISCARIOT, *ihs KAIR ih aht.* See JUDAS.

ISCHIA, *EES kyah.* See NAPLES.

ISÈRE RIVER. This river rises in the Graian Alps of southeastern France, and flows for 180 miles in a southwestern direction. It crosses the French Departments of Savoie, Isère, and Drôme to join the Rhone River a few miles north of Valence. In ancient times, the Isère River was called the *Isara.*

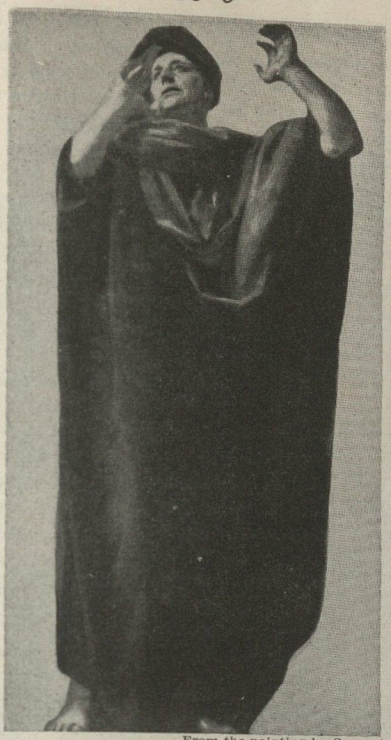
ISFAHAN. See IRAN (Cities).

ISHMAEL, *ISH may el,* was the son of Abraham and Hagar in the Bible. He mocked his half-brother Isaac, and was driven with his mother into the desert. They wandered there for many days as outcasts of society. They almost perished with thirst. Then Hagar cried to God. The Lord sent an angel to direct them to a spring and they were saved.

Ishmael married an Egyptian woman. Their twelve sons established the tribe called *Ishmaelites,* as God had promised Abraham He would (Gen. 17:20). Mohammed claimed to be descended from Ishmael. His followers hold that it was Ishmael, not Isaac, who was offered by his father Abraham as a sacrifice to God. W.A.I.

See also ABRAHAM; BEDOUIN; ISAAC.

ISHTAR, *ISH tahr.* See ASTARTE.



From the painting by Sargent

The Prophet Isaiah taught that God was the creator of the universe. He called on men to be just and kind.

ISINGLASS, *I zing GLAHS,* is the purest form of animal gelatin. It is a tough, semitransparent whitish substance which is prepared from the air bladders of certain fish. The best-quality isinglass comes from the Russian sturgeon. But it may also be taken from the cod, hake, and other kinds of fish.

To prepare isinglass, the bladder is taken from the fish and washed in cold water. Then the black outer skin is taken off. The rest is washed and spread on a board to dry. After it is dry, the bladder is dampened in warm water, and the inner skin is taken out by rubbing and beating. It is then passed between iron rollers which reduce it to a thin, partly transparent ribbon which looks a little like watered silk. The partly transparent sheets used in the panels of stove doors are sometimes incorrectly called isinglass. They are actually made of the mineral mica.

Isinglass is used widely to purify wines, beers, and other liquors. It may also be used in jams, jellies, and soups.

ISIS, *I sis,* was the most important female goddess of the Egyptians. She was both sister and wife to Osiris, and was the mother of Horus.

Isis taught farming to the Egyptians, and had skill

From the painting by Liska

Ishmael Lies on the Desert Sands while his mother, Hagar, prays that they be spared from death by hunger and thirst. The Moslems believe Ishmael was their ancestor. He and his mother are said to have been buried in the sacred city of Mecca.

The WORLD BOOK Encyclopedia

THE WORLD BOOK ENCYCLOPEDIA

IN EIGHTEEN VOLUMES
AND READING AND STUDY GUIDE

VOLUME 9

IJ

FIELD ENTERPRISES, INC.
CHICAGO

THE WORLD BOOK ENCYCLOPEDIA

COPYRIGHT 1953, U.S.A.

by FIELD ENTERPRISES, INC.

COPYRIGHT 1952

1951 - - 1950 - - 1949 - - 1948

by FIELD ENTERPRISES, INC.

COPYRIGHT

1948 - - 1947 - - 1946

1945 - - 1944 - - 1943 - - 1942

1941 - - 1940 - - 1939 - - 1938

by THE QUARRIE CORPORATION

COPYRIGHT

1937 - - 1936 - - 1935 - - 1934

1933 - - 1931 - - 1930 - - 1929

by W. F. QUARRIE & COMPANY

THE WORLD BOOK

COPYRIGHT

1928 - - 1927 - - 1926 - - 1925

1923 - - 1922 - - 1921 - - 1919

1918 - - 1917

by W. F. QUARRIE & COMPANY

International Copyright 1953, 1952, 1951, 1950, 1949, 1948
by Field Enterprises, Inc.

International Copyright 1948, 1947
by The Quarrie Corporation

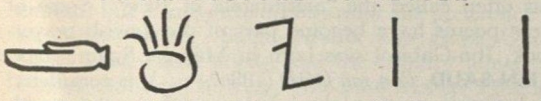
All rights reserved. This volume may not be reproduced in whole or in part in any form without written permission from the publishers.

PRINTED IN THE U.S.A.
ECB

THE WORLD BOOK ENCYCLOPEDIA

I is the ninth letter of our alphabet. It was also a letter in the first known alphabet, which dates from about 1850 B.C. It was used by a people called the Seirites, who lived on the Sinai peninsula north of the Red Sea. They formed the symbol for this letter from Egyptian drawings of a hand. The Phoenicians took this letter

FROM PICTURE TO LETTER



Egyptian 3000 B.C.	Sinai 1850 B.C.	Phoenician 1200 B.C.	Greek 600 B.C.	Roman A.D. 114

into their alphabet. They named the letter *yod*, and used it as a consonant. It had the sound of our letter *Y* in the word *young*. Later the Greeks changed the shape of the letter to a single upright stroke and named it *iota*. They used it as a vowel to represent the sound of long *I* as in the word *pine*, or of short *I* as in the word *pit*. The Romans used this letter to stand for the vowel sounds of long and short *I*, but they also used it, as the Phoenicians had done, to represent a consonant which had the sound of our *Y* in the word *young*. Long after the time of the Romans, a new letter form *J* was developed by adding a tail to the *I*. The new letter was used to stand for the consonant *J* (see J). The form *I* was kept to represent a vowel.

In English the vowel *I* has four main sounds. The English long *I*, as in the word *ice*, is really a diphthong, which means two sounds pronounced together almost as one. Long *I* in English is made up of the sound of *A* as in *father* and of *I* as in *pit*. Short *I* is found in the word *pit*, and the other common sound is heard in the word *fir*. The fourth sound of *I* is most common in all European languages, but very uncommon in English words. It is the Continental long *I* as in *machine*. As a consonant, *I* is found in such words as *genius* and *ruction*. E.F.D.

See also ALPHABET; PRONUNCIATION.

IAMBIC, *eye AM bick*, **METER.** See METER.

IAMBIC PENTAMETER. See BLANK VERSE.

IAPETUS, *eye AP ee tus*. See SATURN.

IAPETUS (in mythology). See PROMETHEUS.

IASI. See RUMANIA (Cities).

IBÁÑEZ, *ee BAH nyays*, **CARLOS** (1877-), was President of Chile from 1927 to 1931. He became known as a dictator because he forbade criticism of the government, jailed people who opposed him, and set up a spy system. The Chilean people rebelled against Ibáñez in 1931 and forced him to resign. He was exiled to Argentina but returned in 1937. Ibáñez ran for President in 1938 and 1942, but was defeated. In 1942 he became Ambassador to Peru. Ibáñez was born at Linares, Chile. He became a general as Minister of War in 1925. He was frequently accused of having Nazi sympathies. F.B.O.

IBÁÑEZ, VICENTE BLASCO. See BLASCO-IBÁÑEZ, VICENTE.

IBERIA, *eye BEER ih ah*, is the ancient name of the peninsula occupied today by Spain and Portugal. The term *Iberia* is still sometimes used in literature, and geographers refer to the *Iberian Peninsula*.

The Iberians were one of the most ancient European peoples. They had rather long heads and were not very tall. The Basques, who now live in northern Spain, are thought to be direct descendants of the Iberians. The language of the Basques still contains some Iberian words. Many other peoples, living in Italy, Spain, and Portugal, are descended from the Iberians. Other descendants of the race are found as far north as Scotland and Ireland. W.E.E.

IBERVILLE, *EE behr veel*, **PIERRE LE MOYNE, SIEUR D'** (1661-1706), was a French-Canadian explorer and naval officer. His explorations resulted in the French settlement of the province of Louisiana.

Iberville was born at Montreal, Canada, and served in the French navy for ten years. In 1698, he commanded an expedition of two ships which sailed from France to found a colony near the mouth of the Mississippi River. Robert La Salle had tried to do this about fifteen years before, but had failed.

Historical Pictures

Pierre Le Moyne d' Iberville, French-Canadian explorer, led the way to settlement of the province of Louisiana.

The expedition arrived in Mobile Bay in 1699, and Iberville set out with a party in small boats. They went west along the coast and then entered the mouth of a great river. Iberville was not sure that he had found the Mississippi until he arrived at an Indian village. There he saw a letter left there thirteen years before by Henry de Tonti, who had been a member of La Salle's party.

Iberville did not find a satisfactory place for a settlement until he found Biloxi Bay. There his party settled what is now Biloxi, Miss. He later also helped colonize what is now Mobile, Ala. J.COT.

See also LA SALLE, ROBERT CAVELIER, SIEUR DE; TONTI, or TONTY, HENRY DE.

IBEX, *I becks*. The ibex is a wild goat. Large numbers of ibexes have been killed by hunters. The common ibex is now found only in a few valleys of the Piedmont in the Alps of Europe. The few which remain are protected by law against hunters. The ibex is called *boutquetin* by the French and *steinbock* by the Germans.

The ibex is gray or brown in color, and is about thirty-five inches high at the shoulder. Its large horns rise high from the forehead and then curve backward. The horns of the male ibex may be more than thirty inches long, and are almost as long as the animal is tall. The longest horns ever found measure almost 45 inches along the outer curve. The horns are three-sided with cross ridges along the front parts. The female has small horns which are only six to eight inches long.

A larger ibex is found in the Himalayan Mountains of Central Asia. Its horns are 50 to 60 inches long. This Asiatic ibex has a large beard and a whitish back, or "saddle." It is graceful and strong, and is able to live in the very high cold regions of the mountains. Ibexes are also found in parts of Africa and Asia Minor. V.H.C.

See also ANIMAL (color plate, Europe and Central Asia).

Classification. The Alpine ibex, *Capra ibex*, and the Himalayan ibex, *C. sibirica*, belong to the family *Bovidae*.

IBIS, *I bis*. The ibis is a wading bird which is closely related to the herons. It looks like a stork and has long legs and a long neck. Its long, slender bill curves downward. Ibises are sociable birds and generally live in colonies. Many pairs often nest in the same tree or some marshy area. The white ibis is commonly found in southern parts of the United States, but is seldom seen farther north than South Carolina. The scarlet ibis is found in tropical America. It is red with black tips on the wings. The sacred ibis of Egypt is black and white and about two and one-half feet long. It was worshiped by the Egyptians and embalmed after death. A.M.BA.

Classification. The white ibis, *Guara alba*, the scarlet ibis, *G. rubra*, and the sacred ibis, *Threskiornis aethiopica*, belong to the family *Ibidae*.

IBN BATUTA (MUHAMMAD IBN ABDULLÁ) (1304-1377). See EXPLORATION AND DISCOVERY (Table of Famous Explorers).

IBN EZRA (1092-1167) was a Jewish author and poet, best known for his writings on the Bible. He also wrote many books on astronomy, mathematics, grammar, and philosophy.

His full name was Abraham ben Meir ibn Ezra. Ibn Ezra was born in Toledo, Spain, and became a master of languages and one of the most famous scholars of his time. He was the inspiration for Robert Browning's poem "Rabbi Ben Ezra." LJB.

IBN-GABIROL, *ihb'n gah BEE rohl*, or **BEN-GABIROL, SOLOMON BEN JUDAH** (1021?-1058?), was a Jewish poet and philosopher. His chief work in philosophy was *Yanbū 'al-Hayāh*, or *The Well of Life*, which greatly influenced the scholastic philosophy of the Middle Ages. He wrote many religious poems in Hebrew and was often called the "nightingale of Piety." Some of these poems have become part of the Jewish prayer-book. Ibn-Gabirol was born in Málaga, Spain. LJB.

IBN-SAUD, *ib'n sah OOD* (1880?-), is considered the most important absolute monarch in the world. Saudi Arabia, of which Ibn-Saud became king in 1932, is the largest Arab country. As its ruler, Ibn-Saud largely controls Arab thought and opinion. His country contains Mecca, the holy city of the Moslems, and so Ibn-Saud is a leader of the Moslems. His country also contains one of the largest oil fields in the world. Saudi Arabia's position on the Red Sea route to the Orient gives it great strategic importance.

Ibn-Saud made himself king. He was born in Riyādh, capital of the state of Nejd. His family had once ruled much of Arabia, but had lost influence. Ibn-Saud determined to regain his family's lost power. In 1900 he captured Riyādh, and in twelve years extended his power to all of Nejd. In 1913 his forces invaded the state of Hasa, on the Persian Gulf. The Turkish forces which then ruled it were too weak to resist him, and

P&A

The Scarlet Ibis' Bill is a fine tool for scooping up food from swamps.

H. Armstrong Roberts

This Straw-necked Ibis lives in Australia. It gets much of its food from marshes or shallow water.

William L. & Irene Finley

The White-faced Glossy Ibis has long slender legs.

he added Hasa to his kingdom. In 1924 he invaded and conquered the western state of Hejaz, in which Mecca is located. Eight years later, he named his kingdom Saudi Arabia and himself king.

INP

Ibn-Saud created the modern kingdom of Saudi Arabia.

Ibn-Saud set out to modernize his kingdom by building up a standing army and police force. He forced his people to recognize property rights, and made desert raids, which had been common, punishable by death. In 1933 he permitted American oil companies to lease oil lands in his country.

During World War II, Saudi Arabia was officially neutral, but Ibn-Saud early showed his preference for an Allied victory. Saudi Arabia was given United States Lend-Lease goods, and the country joined the United Nations. In 1945 Ibn-Saud visited President Franklin D. Roosevelt aboard the cruiser *U.S.S. Quincy* in the Red Sea. E.McI.

See also HEJAZ (History and Government).

IBN-SINA. See AVICENNA.

IBSEN, *IHB sen*, **HENRIK** (1828-1906), is considered the father of the modern drama. His importance in the theater of his time was so great that he was called "the Colossus of the North." He promoted realism in the drama, both in subject matter and in handling characters and dialogue. His people were real people, and their problems were real problems.

Ibsen was the first playwright to deal with social problems. His play, *A Doll's House*, was concerned with a problem of marriage. *Ghosts* dealt openly with the forbidden topic of venereal disease. Ibsen's plays were the first of the "problem plays." They directly influenced the writings of such later playwrights as Anton Chekhov and George Bernard Shaw.

Brown Bros.

Henrik Ibsen, the great modern playwright of Norway

Ibsen strongly believed in individual freedom. He also believed in the glory of work. It is said that he dreamed of the reorganization of society through the influence of women. Ibsen's influence as a thinker was in some ways as great as his influence as a playwright. His daring in discussing many problems often led to progress in solving those problems. His insistence on truth as a basis for all social relationships was one of his chief contributions.

Ibsen's own life was much duller than his plays. He was born in Skien, Norway. His father lost most of his money when Ibsen was a boy, and when Ibsen was fifteen he went to work for a pharmacist. His first literary work was an unsuccessful tragedy, *Catilina*, produced in 1850. Ibsen became stage director of Ole Bull's National Theater at Bergen in 1851. In 1864, he left the country because he disapproved of Norwegian politics, and he lived in Germany and Italy until 1891, when he returned to Norway.

Ibsen's playwriting career may be divided into two general periods. In the first twenty-five years, he produced mostly historical dramas. Many of these were based on Norwegian folklore. Ibsen's "realism" began to appear in his handling of the characters in *The Warriors of Helgoland*. The period in which Ibsen was greatly concerned with social problems began with the production of *The Pillars of Society* in 1877. Ibsen's plays have been translated into many languages. Many of the later ones are occasionally played today. B.H.C.

See also DRAMA (The Rise of Realism).

His Works include *Brand* and *Peer Gynt*, two dramatic poems; *The League of Youth*, a political satire; the historical plays, *The Banquet at Solhaug* and *The Pretenders;* and the social dramas, *The Wild Duck* and *Hedda Gabler*.

ICARUS, *ICK ah rus*. See DAEDALUS.

ICE. The tiniest snowflake or particle of frost weighs less than a small bird's feather. The weight of a glacier is measured in hundreds of billions of pounds. But snowflakes, frost, and glaciers are all ice, and are formed just like the ice on rivers, lakes, and sidewalks on a cold winter day. All these kinds of ice are formed when the temperature of water or of moisture in the air falls below the freezing point.

Pure water and moisture in the air form ice at 32° Fahrenheit or 0° centigrade. But water which contains impurities will not freeze until lower temperatures are reached. Sea water, because of the salt it contains, freezes at 27° F. Sugar and alcohol are other substances

General Electric

Ice-Covered Building and Radio Tower on top of Mount Washington, New Hampshire. The snow and sleet, whipped by a mile-a-minute wind, has formed three-foot ice feathers in a single night. This lonely, frozen mountaintop is very valuable to science, because it has the world's worst weather. Aircraft and weather-forecasting instruments are tested here. These tests helped scientists to solve subzero weather problems.

which lower the freezing point of water in which they are dissolved. Automobile drivers put alcohol in the

Acme

Cutting Ice Blocks from a Frozen Lake with a gasoline-powered saw. The ice has been marked in large squares and the men guide the saw by pulling the sled. A wire runs from the sled handle and acts as a clutch to throw the saw into motion. The man on the right is prodding the cut squares loose. The blocks are then dragged to an icehouse.

radiators of their cars in winter so that the water which cools the engine will not freeze.

When water freezes, it increases its volume by one eleventh. This means that when eleven cubic inches of water freeze, twelve cubic inches of ice are formed. Thus ice is lighter than water and will float in it. This expansion of ice is also the reason why frozen water pipes split open in the winter, and why freezing of the water in an automobile radiator will damage th unless alcohol or some other antifreeze is mixe After it freezes, ice continues to get colder until i the same temperature as the surrounding atmosp Ice starts to melt into water when the surrounding perature goes above 32° F. But until all the i melted, the temperature of both the water and th melted ice will remain at 32° F.

At one time, glaciers of ice covered most of N America, and parts of Europe, Asia, and South A ica. These great sheets of ice ground down hills, ened valleys, and scooped out the beds of some o largest lakes. Scientists call this period in the w history the ice age, or glacial epoch. See Ice Ag

The glaciers have retreated to the polar icecap the earth, and today ice is most important as a m of adding to our health and comfort. Ice is packed refrigerators or railroad refrigerator cars, to keep and vegetables from spoiling while being shipp markets sometimes thousands of miles from the where the produce was grown. Ice protects our from spoiling in the same way. It cools off these to a point where the bacteria which spoil food very slowly. Ice is used in many household refrige and in some air-conditioning equipment used t homes, offices, and theaters in summer. Ice appe millions of dinner tables every day to chill beve

The Ice Industry

More than $300,000,000 worth of ice is sold United States every year. Most of this is manufa ice, made by freezing water in ice plants. Some m ice is cut from rivers and lakes, especially in C and in the northern part of the United States.

U.S. West

Damage by Ice Storms Costs Millions of Dollars every year in the United States. Telephone repair crews in the Rocky Mountains carry snowshoes and mountain-climbing equipment. The weight of the ice and the high-speed wind can s snap heavy wires and break thick poles. Many wint mobile accidents are caused by ice-covered streets.

or will damage the car
antifreeze is mixed in.
get colder until it has
rrounding atmosphere.
n the surrounding tem-
ut until all the ice is
the water and the un-

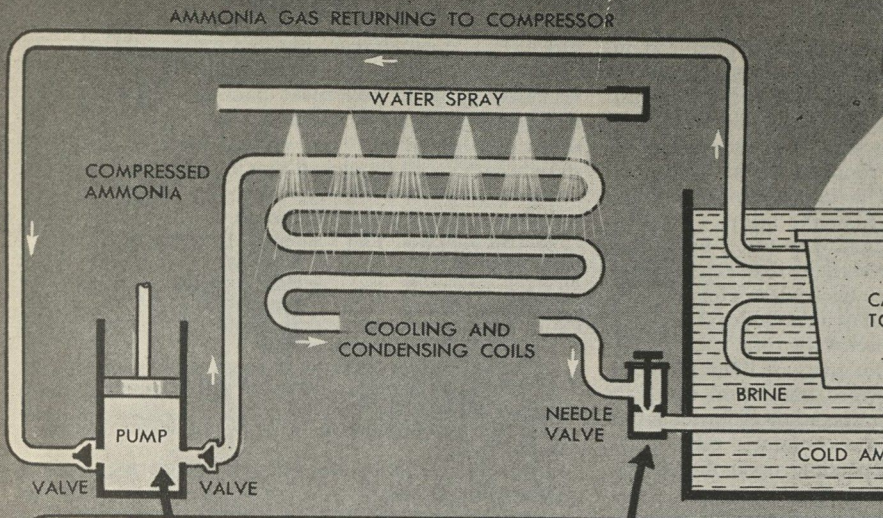
covered most of North
Asia, and South Amer-
ound down hills, deep-
the beds of some of the
s period in the world's
poch. See Ice Age.
to the polar icecaps of
t important as a means
nfort. Ice is packed into
ator cars, to keep fruits
while being shipped to
of miles from the fields
Ice protects our meat
It cools off these foods
which spoil food grow
household refrigerators,
equipment used to cool
summer. Ice appears on
day to chill beverages.

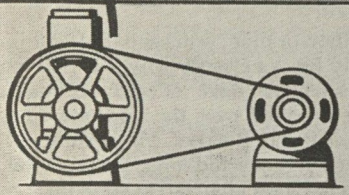
ustry

orth of ice is sold in the
of this is manufactured
ice plants. Some natural
s, especially in Canada
United States.

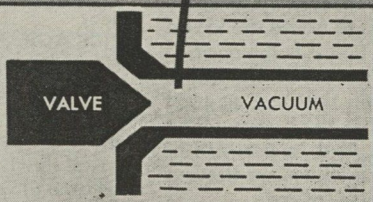
U.S. Weather Bureau

**gh-speed wind can sometimes
ck poles. Many winter auto-
ce-covered streets.**

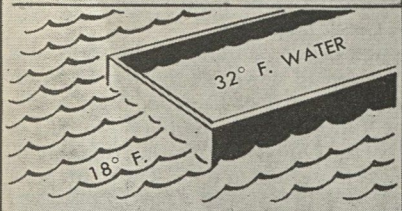




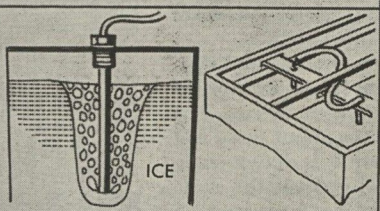
Ammonia gas is changed into liquid by pressure from a pump. Water sprays cool the pipe through which it flows.



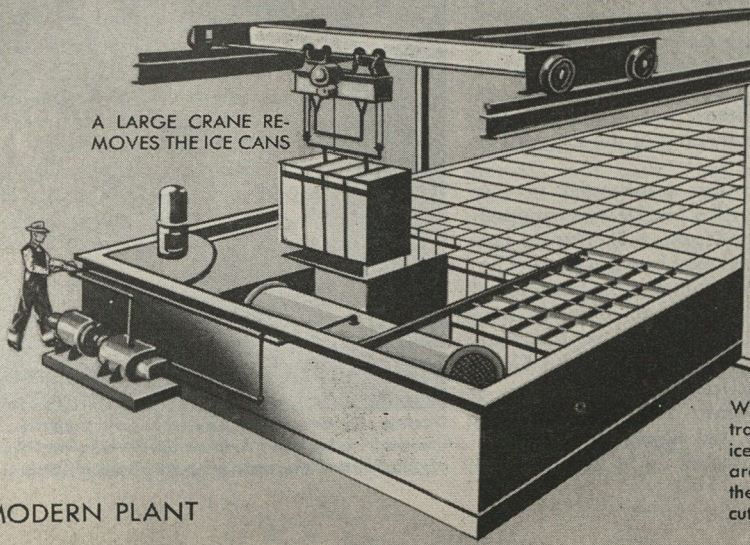
The liquid becomes very cold when it changes back to a gas as it enters the vacuum coil in the brine tank.



The frigid brine is circulated around the cans of pure water to be frozen. The water turns to ice at 32 degrees.



A jet of compressed air blows into the cans to make the water circulate. This makes it freeze more rapidly.



A MODERN PLANT

Ice Manufacture. Manufactured ice is produced in large blocks weighing 300 to 400 pounds each. Pure water is placed in a long rectangular metal can with an open top. The can is lowered into a solution of salt water, or *brine*. The brine is kept at a temperature of from 6° F. to 18° F. by running liquid ammonia through pipes in the brine. The liquid ammonia, which is very cold, takes up heat from the brine. This heat boils the ammonia off as a gas. The water in the ice cans freezes first around the sides so that expansion is upward toward the top, which freezes last. Thus the can is not split open by expansion as a container of water is when left outside in the winter. When the cakes of ice are frozen solid, the metal containers are lifted from the brine by hoists and then dipped into warm water to loosen the cakes. The entire operation of forming the ice and loosening it from the containers takes from twenty to sixty-six hours, depending upon the size of the blocks and the temperature of the brine.

Recently new methods have been developed to freeze ice in smaller pieces. One method is to freeze the ice on the outside of a turning cylinder. Then it is removed in small flakes. Another machine freezes ice on the inside of a cylinder with ridges on it. When the ice is scraped off this ridged cylinder, it looks like thick snow. The snow is pressed into small bricks, called *briquettes*. Still another machine freezes tubes of ice which are thawed loose and broken into small cylinders of ice.

Natural Ice. In the United States, natural ice is harvested in many of the northern states. There are many huge icehouses on the lakes and streams where pure water freezes into good ice. Some of these icehouses are three hundred feet long and five stories high.

Scrapers are used to clean the ice of snow and dirt. Then a machine called a marker makes an outline on the ice, marking the blocks which are to be cut. The marker cuts a series of straight grooves about three feet apart up and down the stream. Then it is drawn crosswise of the stream marking parallel grooves the same distance apart. This makes squares of ice. A plow which has a steel bar fitted with a set of sharp knives follows along behind the marker. It cuts the grooves even deeper, so that it is easy to pry the cakes of ice loose and float them to shore through channels in the ice. Sometimes a *power saw* is used instead of the plow. It has a rotating wheel with a saw-toothed edge. After the cakes are floated to shore, they are slid up slanting boards or troughs into an icehouse. There they are packed in sawdust. The icehouse has insulated walls to keep out heat and reduce melting of the ice until it is taken out to be used.

History. Natural ice was first transported in the United States in 1799, when ice blocks were shipped from New York City to Charleston, S.C. During the early 1800's quite a trade developed in natural ice. The speedy clipper ships carried natural ice from New England to many parts of the world. This ice was shipped to Charleston, S.C., New Orleans, La., and other southern ports, to California during the Gold Rush, and even to the West Indies and India.

In 1834 Jacob Perkins invented the first ice-making machine, which worked on the liquid-gas principle. The first artificial ice plant was set up in 1868 at New Orleans. The same year, the first refrigerator car built. This opened new markets for many fruit vegetable growers and meat packers. It meant meat animals could be killed and packed in Texas shipped to the East Coast without spoiling, and strawberries could be picked ripe in southern states shipped northward. By 1930, 165,000 refrigerator were in use on American railroads. H.T

Related Subjects. The reader is also referred to:

Cold Storage	Iceberg
Dry Ice	Refrigeration
Freezing	Regelation
Hail	Snow

Questions

What are some common forms of ice?

At what temperature does sea water freeze? H do you explain this?

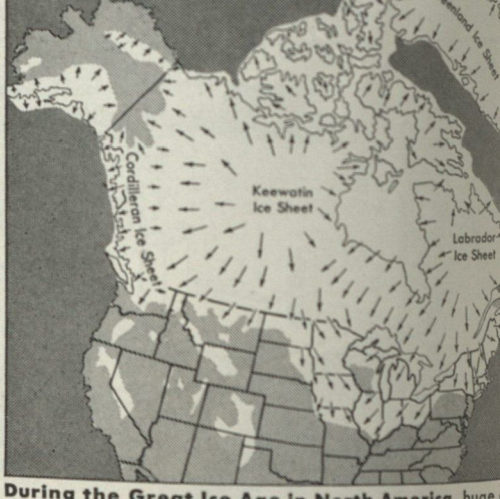
What causes pipes to burst when water free inside them?

What is meant by the Ice Age? What happe during this period?

Who invented the first machine for manufactur ice?

ICE AGE. A million or more years ago, the world very cold. Nobody knows exactly why the cold c although many scientists have offered explana Great sheets of ice formed over the northern lan both North America and Europe. These sheets moved slowly south and covered large areas of lan one time they covered more than 8,000,000 square of the earth's surface. (See GEOLOGY [Glaciers Ch the Earth]). The period in which these glaciers m is often called the glacial epoch. Geologists also c the Pleistocene age. This name means *most recent* is taken from the Greek language.

When the ice age began, summers grew short cool. The ice sheets spread slowly southward. In N America they covered much of Canada, most o upper Mississippi Valley, and the northeastern pa the country north of the Ohio River. During this pe the climate changed from time to time. The earth



During the Great Ice Age in North America, huge sheets of ice together covered all Canada and Labrador of Alaska, and the northern part of the Mississippi Valle

Three of the Most Important Periods of the Ice Age are shown in these maps. During the second period, ice spread from the Scandinavian peninsula over a large part of Northern Europe and into Western Asia. During the third period, the ice sheet was much smaller. During the fourth period, the glacial cap remained almost entirely in the Scandinavian region.

warmer, and the great sheets of ice melted back toward the north. Grass began to grow where the ice had been, and animals slowly ventured north. But then the weather grew cold again, and the ice moved down from the north. There were at least three such great ice invasions. Some authorities believe there may have been four or five.

Just as nobody knows why the glaciers came south, nobody is certain why the glaciers retreated. Some scientists believe that we are now living in an interglacial age, when the weather has grown warm. They believe that the climate may again grow cold, and the ice sheets move south again. The last great ice sheets began to grow about 100,000 years ago. For more than 60,000 years they continued to grow, and then they began to melt again. There was no more ice in Minnesota, for example, by about 15,000 years ago.

The ice sheets covered vast areas of both Europe and North America. They covered the Scandinavian peninsula, Denmark, The Netherlands, northern Germany, the British Isles, and large parts of Poland and Russia. At the same time, glaciers came down out of the Alps and the Caucasus Mountains and covered large parts of the surrounding regions. Glaciers also came down from the Pyrenees.

Some parts of land areas in the Southern Hemisphere were also covered. The ice sheets extended over Australia and parts of South America.

The ice sheets seem to have come from certain places on each continent. There were three important ice sheets in North America. One of them came from Labrador, and was called the Labrador ice sheet. Another developed in north-central Canada. It was called the Keewatin ice sheet and eventually came down to Minnesota, Iowa, and the Dakotas. A third formed in the far western part of Canada. It was called the Cordilleran ice sheet and it came down into Washington and Montana.

These ice sheets were often astonishingly thick. Iowa was once covered with about 2,500 feet of ice. In New York the ice sheets were so thick that they covered the tops of the Catskill mountains as they moved southward. In other places, particularly in the far north, the ice must have been a mile thick.

Effects of the Ice Sheets. As the ice sheets moved south they scraped up rocks and stone from the earth and carried them with them. They picked up large rocks and ground them until they became smaller. The ice sheets ground off the tops of hills. They cut valleys deeper. In some places they left the rocks they carried between the peaks of mountains, and made the countryside much more level than it had been before.

Rocks were left behind in mounds at the end of the ice sheets when they melted. These mounds are called *terminal moraines*. Other rocks were left along the sides of the ice sheets in the form of *lateral moraines*. The mixture of boulders, rocks, and fine sand the ice sheets carried is called a *glacial drift*.

In some places where the ice sheets melted, animals and plants came back to live. Then the ice sheet moved down again, and the remains of the animals and plants were buried beneath the ice. In other places, the ice sheet left only bare bedrock.

When the ice melted, it turned into water which ran off in the form of streams. Some of the water remained in the low places on the earth and became lakes. This is the reason why Minnesota and Wisconsin have so many lakes. In other places, the water formed lakes which eventually dried up or ran off. These lake beds collected silt which became the fine fertile soil found in such places as the valley of the Red River of the North. The Great Lakes formed when the Labrador ice sheet withdrew. The Great Salt Lake was also formed during the ice age.

Animals and Plants of the Ice Age. Most of the plants we know existed before the ice age. Therefore, the remains of plants of the Pleistocene age are very much like those found at present. Mammoths and mastodons, saber-toothed tigers, giant ground sloths, and other animals that have since died out lived in North America during the ice age. The camel and wild horse, now found only in the Old World, lived in North America during the Pleistocene age.

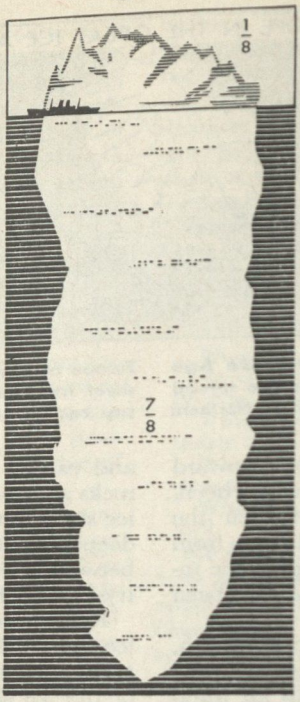
As the ice advanced, these animals were forced to move farther south. Some of them died out. Others lived in the warmer parts of the continents.

Scientists know that early man lived in Europe during part of the ice age, and there is some evidence that he reached North America during the late part of the period. P.O.McG.

See also GLACIER; MAMMOTH; MORAINE; SABER-TOOTHED CAT.

ICEBERG. Huge masses of ice may break off the lower end of a glacier and fall into the sea. These masses are called icebergs. Fog and icebergs are the greatest natural dangers that ships face. The icebergs in the North Atlantic Ocean come from the island of Greenland, which is nearly covered with a huge ice sheet more than 700,000 square miles in area and several hundred to several thousand feet thick. Long tongues of ice reach down from the margins of this ice sheet to the sea. It is from the ends of these ice tongues that icebergs are broken off. The breaking off of an iceberg is caused either by cracks in the ice or by the action of rough sea waves. The breaking is accompanied by noises like great explosions and rolling thunder. If the iceberg drops into an enclosed bay, it may cause huge waves.

Most of the icebergs in the North Atlantic form along the east coast of Greenland. They drift across Baffin Bay and Davis Strait to the coast of Labrador. Here some of the icebergs are caught in the Labrador Current and are carried through the Newfoundland Banks into the Atlantic Ocean. In this region, the icebergs melt rapidly because of the sunshine and warm ocean water, and break up into small packs called *ice floes*. They disappear altogether about 400 miles south of Newfoundland.



Seven Eighths of an iceberg is below the surface of the ocean. Only one eighth of the huge mass can be seen.

The greatest numbers of icebergs reach the routes of transatlantic liners in April, May, and June. That is the reason why ships crossing the Atlantic follow a more southerly course during these mont

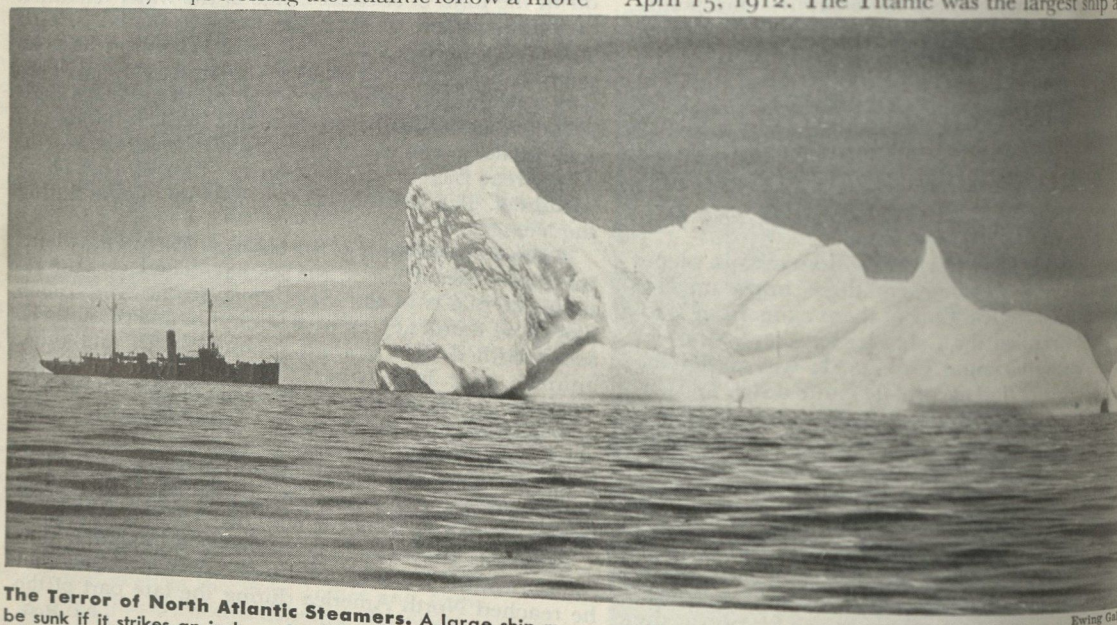
There are also regions in the So Hemisphere where many iceberg seen. These icebergs drift out to sea the great Antarctic ice cap. Some o icebergs are many times larger than found in the North Atlantic.

Description. Explorers have w vivid descriptions of the beauty and of icebergs. They have compared to towers, spires, pyramids, cathe and palaces. The largest icebergs several million tons, and some of are several miles long. The bigges tower as much as four hundred feet the surface of the ocean. This is o small part of the whole iceberg, ho Only from one eighth to one-tenth total mass of the iceberg is abov water.

The ice of icebergs is usually clea very tightly packed. The colors of a berg are generally blue, green, or n white. When the sun is shining, st of water form on the glistening slo icebergs and drop over their edg waterfalls.

Icebergs often carry away large ders and quantities of gravel from glaciers. These are carried for hun of miles and finally dumped into th when the iceberg melts.

Ice Patrols. Icebergs can be extremely dangero ships. One of the greatest sea disasters in the w history was the sinking of the *Titanic* on the nig April 15, 1912. The Titanic was the largest ship a



Ewing Ga

The Terror of North Atlantic Steamers. A large ship may be sunk if it strikes an iceberg floating in the ocean. This great iceberg is being watched by a ship of the International Ice Patrol. As the iceberg drifts along, the patrol boat will send radio messages to passenger and cargo ships, warning where the iceberg is so that they can steer clear of it. Mo radar equipment that pierces fog and darkness is now used to warn vessels when icebergs are near.

in those days, and was on its first trip from Liverpool to New York. The ship struck an iceberg, and 1,517 persons lost their lives.

The wreck of the *Titanic* led to the establishment of an International Ice Patrol along the North Atlantic ship lanes. Since 1914, the patrol has been maintained through a sharing of its expenses by the principal shipping nations of the world. The United States uses the Coast Guard for its share of the patroling. The patrol reports the position of icebergs and charts their probable courses. Very sensitive instruments detect the presence of icebergs in thick fogs. See COAST GUARD.

There is little that man can do to control icebergs. It is difficult to destroy an iceberg by blasting, or to steer it into a different course which would take it out of the ocean lane. It is even difficult to approach an iceberg in safety, since the submerged parts may tear open the bottom of a ship. Icebergs also have been known to turn over.

Icebergs are formed by fresh water. Therefore, they have been of use to sailors as an emergency supply of fresh water. This water from the melting glacial ice collects in pools on the surface of the iceberg. On more than one occasion, ships have obtained a badly needed supply of water by drawing off the water from such iceberg pools into small boats. F.M.F.

See also GLACIER.

ICE BOATING. See ICE YACHTING.

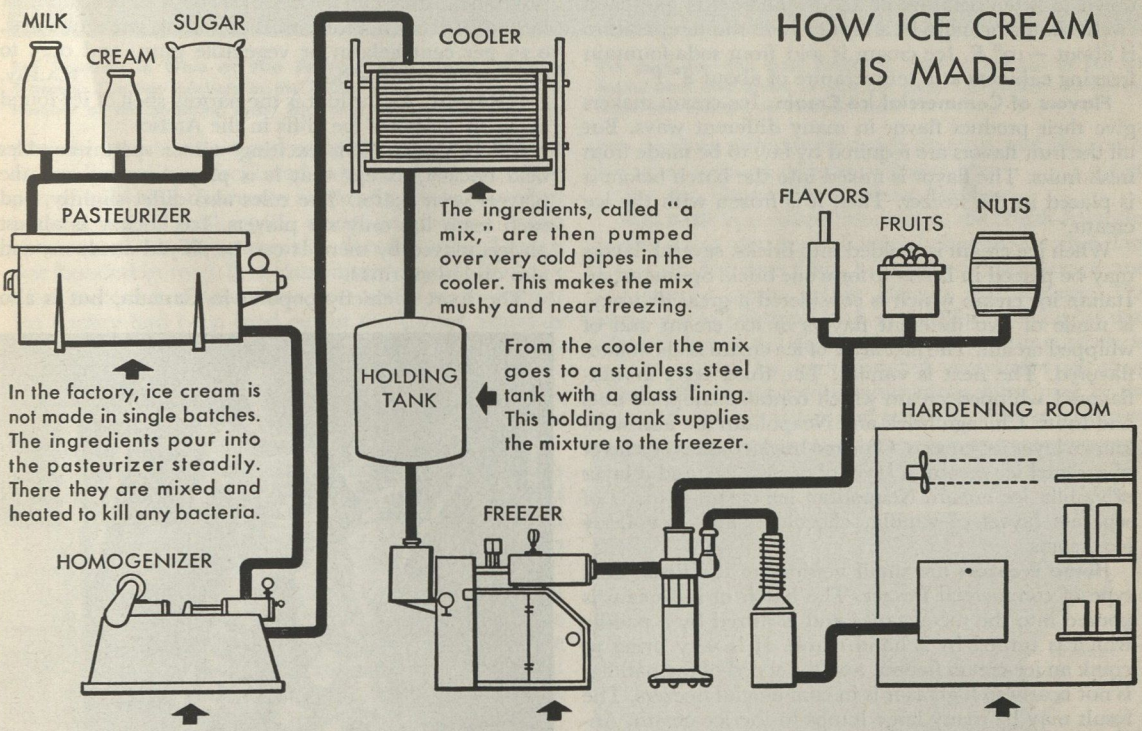
ICEBOX. See REFRIGERATION.

ICEBREAKER is a vessel designed to plow through ice and open a path for other ships and boats. Icebreakers also rescue vessels stuck in ice. The first ship ever to make a winter trip through the Soo locks at the eastern end of Lake Superior was the Coast Guard icebreaker, *Mackinaw*. This 10,000-horsepower vessel made the trip in January, 1945.

Icebreakers have strong hulls of special design and great power. They can ram through thin ice, but they break thick ice by driving their bow ends up on top of it. Ice four feet thick will give way under the weight of a large icebreaker's bow. J.J.F.

ICE CREAM. The foods which we like best are seldom the foods which are best for us. But ice cream, a treasured treat of young and old alike, is one of the most nourishing foods in our diet.

Ice cream contains milk and cream, sugar, flavoring, usually a small amount of gelatin or vegetable gum, and frequently eggs. These ingredients are stirred together into a liquid mix. Then the mix is placed in a container to be stirred at the same time that it is frozen. The stirring is perhaps the most important part of making good ice cream. The mix next to the sides of the container freezes faster than the rest. Unless it is constantly scraped off the sides of the container and beaten into the mix,



tiny crystals of ice will form in the ice cream. The machine which is used to mix and freeze ice cream must be equipped with a paddle or some other mechanism which will stir the ice cream properly. All ice-cream freezers work on this principle, but they fall into two general types. One is the freezer used to make ice cream which is to be sold, or commercial ice cream. The other is the freezer which is used to make homemade ice cream.

Commercial Ice-Cream Freezers are metal tanks or metal pipes surrounded by a freezing mixture. Usually this freezing mixture is salt water, or brine, which is kept at a temperature of about −10° F. The liquid ice cream is poured into the metal container, and is constantly stirred by paddles. The paddles are driven by electricity and turn at high speed. Ice cream begins to freeze at about 28° F., and the constant beating and stirring which goes on inside the batch causes the entire liquid to begin to stiffen at the same time. It also causes the fat globules in the ice cream to be distributed evenly through the mix. In the metal-pipe type of commercial freezer, the ice cream is frozen almost instantly, and the paddles inside the freezer push the stiffened ice cream out in a continuous stream. In the metal-tank type of commercial freezer, it takes considerably longer to freeze the ice cream. In both types of freezers, the ice cream is removed from the container when the mix has gone down to a temperature of 24° F. Then it is hardened twelve hours or more in a room where the temperature is about −10° F. Ice cream is sold from soda-fountain freezing cabinets at a temperature of about 8° F.

Flavors of Commercial Ice Cream. Ice-cream makers give their product flavor in many different ways. But all the fruit flavors are required by law to be made from fresh fruits. The flavor is mixed into the batch before it is placed in the freezer. Then it is frozen with the ice cream.

When ice cream is molded into bricks, several flavors may be placed in layers to form one brick. Spumone, an Italian ice cream which is considered a great delicacy, is made of two different flavors of ice cream and of whipped cream. The first layer of ice cream is chocolate-flavored. The next is vanilla. The third layer is rum-flavored whipped cream which contains chopped nuts and fruits. Chicago brick and Neapolitan are also well-known layer ice creams. Chicago brick consists of a layer of caramel ice cream, a layer of orange ice, and a layer of vanilla ice cream. Neapolitan ice cream is made of separate layers of vanilla, chocolate, and strawberry ice creams.

Home Freezers are small versions of the metal-tank type of commercial freezer. The batch of ice cream is poured into the metal tanks and is stirred by a paddle which is turned by a hand crank. It is very tiring to crank an ice-cream freezer, and the speed of the paddles is not nearly so high as it is in commercial freezers. The result may be many large lumps in the ice cream. Another difficulty in home freezing is that the refrigerant is generally a mixture of commercial ice and salt which does not get as cold as the commercial brine refrigerant. A few home freezers are run by electricity, but even so the ice cream does not turn out as well as commercially frozen products, because few homes have the equipment to cool it further after it is removed from the freezer.

Another way to make ice cream in the home is to place the batch in the ice-cube trays of an electric refrigerator. The batch is allowed to freeze until about a half-inch of ice cream is frozen to the sides and bottom of the tray. Then it is scraped from the tray into a cold mixing bowl and beaten with an egg beater. After it is thoroughly whipped, the ice cream is returned to the tray for further freezing and hardening.

History. The first ice cream is believed to have been made in Italy about 1550. The natives there had long used ice from the mountains to cool their beverages. They discovered that ice and salt made a freezing mixture which resulted in a product much like our modern ices. There remained only to add milk or cream, and the Italians had ice cream. Ice cream was first served in the United States by Dorothy Todd (Dolly) Madison. She served the strange frozen dessert to guests at a dinner in the White House in 1809. For many years ice cream remained a secret of expert chefs, and was served only on special occasions.

The first ice-cream factory was set up in Baltimore in 1851 by Jacob Fussell. But it was not until the 1900's that ice cream became a national dessert. Today, ice cream is considered a typically American dish, and its ingredients and process of manufacture are controlled by Federal and State pure food laws. The usual composition of American ice cream is about 12 per cent milk fat, 10 per cent nonfatty milk solids, 15 per cent sugar, 0.25 per cent gelatin or vegetable gum, and 0.25 to 0.50 per cent egg solids. R.A.Hav.

ICE FOOT. An ice foot is the narrow shelf of ice found along the edges of ice cliffs in the Arctic.

ICE HOCKEY. This exciting winter sport resembles field hockey, except that it is played on ice and the players wear skates. The rules also differ slightly, and each team has only six players. Ice hockey is almost always played by men. It can be played outdoors, and also on indoor rinks.

The sport is chiefly popular in Canada, but is also

Lambert

The Goal Tender, Commonly Called the "Goalie," wears heavy padding. It protects him from the flying puck which players of the other team try to drive past him into the net behind. It also protects him from the blows of the clubs.

Lambert

Ice Hockey Is One of the Fastest and Most Exciting Games. The two players in the center are trying to block a member of the opposing team who tries to drive the puck into the goal net. The goal tender in front of the net at the left waits, alert and tense, to stop the puck. Professional ice hockey is played indoors on artificial ice.

played in the northern and central parts of the United States. It was begun in Canada and the first games were played at McGill University about 1875. It remained an amateur game until 1908, when professional teams were organized. The present National Hockey League was founded in 1917. It became international after 1925 when eastern American cities were added to the circuit. Ice hockey had been tried out in the United States as early as 1897. But it did not become popular until professional teams began to play. Then the speed and daring action of the game attracted huge crowds. Some northern United States colleges look on ice hockey as a major sport.

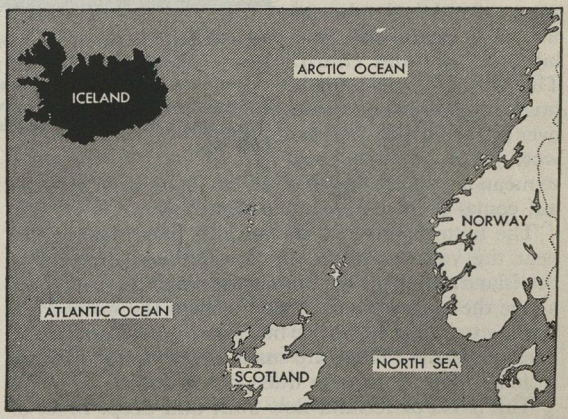
How the Game Is Played. Ice hockey is played on a rink about 85 feet wide by 200 feet long. This rink is divided into three equal zones and is surrounded by a bank. A goal net four feet high and six feet wide stands at each end.

Each player carries a stick about 46 inches long and curved at the end. The players use these sticks to drive a hard rubber disk, called the puck, across the ice. The puck is about three inches across and one inch thick. Each team tries to drive the puck across the goal line into the net of the opposite team.

A team consists of two wing men, one center, two guards, and one goal tender. The game starts when the referee drops the puck between the two opposing centers. This play is called the face-off. The teams play for three periods of 20 minutes each. A score counts one. A team member may be suspended from the game for one or more minutes for rough playing, and the rest of his team goes on playing without him. E.D.M.

See also HOBBY (Books about Hobbies).

ICELAND is an island republic in the North Atlantic, just south of the Arctic Circle. It has been called THE LAND OF ICE AND FIRE, because volcanoes erupt and hot springs steam beside glaciers and icecaps. The scenery is as wild and stark as the Northern Lights that often flicker in the sky. Bright green meadows nestle in valleys edged by snow-covered mountains or steep black cliffs. Ice-coated mountaintops shine pink in the rays of the morning sun, and rough stretches of hardened



Location of Iceland (Shown in Black)

lava lie gray and dark in the shadow of the mountains.

Iceland has been inhabited for more than a thousand years. The island had a republican form of government and a popular assembly as early as the year 930. Icelandic literature in the 1200's was among the finest writing of that time.

The Land and Its Resources

Location, Size, and Surface Features. Iceland covers an area of 39,758 square miles. It is about the size of the state of Virginia. Among the European islands, Iceland is second in size only to Great Britain.

Iceland is about 300 miles long and almost 200 miles wide. It lies between Great Britain and the island of Greenland. For the location of Iceland, see WORLD (colored map).

Mountains cover much of the surface of Iceland. A narrow belt of lowlands lies along the southern and southwestern coasts. Back of the coastal plains the land rises sharply into rough central highlands, with high ridges and mountain peaks.

The island has been built up by the outpourings of volcanoes. The central highlands are a barren wilderness of lava beds and fields. Old volcanoes, no longer active, have built up high craters to form many of the mountains. They have taken on strange shapes as the hot lava has settled and hardened through the years. About twenty volcanoes are still active. The Hekla is the most famous of the active volcanoes.

Hot springs and spouting geysers cloud the landscape with their steam, and mud lakes bubble and churn. The Great Geyser hurls a huge column of hot water over 150 feet in the air. The word *geyser*, which is used to mean any hot spring that sends a jet of water into the air, comes from the Icelandic name *geysir*.

The hottest spring in the world is found in Iceland near the volcano Hekla, in the southwestern part of the island. Deep in the spring the water is 50 degrees above the boiling point. Pressure keeps the water from turning to steam. Many ice fields stretch cold and white over the island. These are made up of "dead" glaciers which no longer move as true glaciers do.

The rivers of Iceland flow swift and deep. Most of them start in the ice and snow of the inland mountains. They plunge down steep, high waterfalls on their way to the plains and the sea.

The southern coast line of Iceland is rocky and fairly regular, with few good harbors. A natural harbor at the southwestern tip forms the port of Reykjavik, the capital of Iceland. A large peninsula juts out from northwestern Iceland into the sea. It has high cliffs along its banks, and it is cut by deep fiords, much like the coast of Norway.

Climate. The Gulf Stream flows near the southern coast of Iceland. Winds blow over its warm currents and give the southern part of the island a mild, moist climate. The winter wind is so strong that often snow seems to be blowing past sidewise, instead of falling from the sky. The average summer temperature in this part of Iceland is 48 degrees, and the average winter temperature is 32 degrees. The days are almost twenty-four hours long in the summer, because the island lies so far north. Winter nights are as long as summer days.

U.S. Signal Corps

This Young Woman of Iceland is wearing a holiday costume of the country. The full, flowing skirt is covered with an embroidered overskirt and topped with a sheer black blouse. A long tassel hangs from her velvet cap. Many Icelanders are descendants of the early Norsemen, and have blonde hair and blue eyes.

The climate in central Iceland is colder than along the southern coast. The glaciers and the ice-caps on the mountains never melt. The northern point of Iceland just touches the Arctic Circle. The climate of northern Iceland is slightly warmer in summer than that of the southern part, but is colder in winter.

Natural Resources. Iceland has rich deposits of sulfur and a kind of brown coal called lignite, but very few of these deposits have been mined. Small amounts of iron, copper, and gold have also been found. The country was at one time rich in deposits of a clear, nonmetallic mineral called *Iceland spar*, which is used to make prisms and crystals for optical and scientific instruments. But most of the known deposits of this mineral have been exhausted.

The soil in southern Iceland is rich enough for raising crops. Meadows cover the land that is too rough to be planted in crops, or which gets so much wind that crops will not grow. Much of central and southern Iceland is covered with lava or ice fields and cannot be planted.

Almost no trees grow in Iceland. There are a few birches and mountain oaks, but these are midget trees, kept small by the cold climate and the high winds.

Seals are almost the only wild animals found in Ice-

De Cou, Ewing Galloway

Two Icelanders Set Out on a Journey in a remote rural section of the island. Each has a pony to ride, and a pack pony to carry his baggage. The shaggy little ponies of Iceland are especially useful in places that have no roads. The houses in the picture are built partly of sod, and look like little hills from a distance. Houses in Icelandic cities are usually of concrete.

land. More than a hundred kinds of birds live on the island. About half of them are sea birds. The most important is the eider duck, which is valued for its soft feathers, or down. The rivers and coastal waters of Iceland teem with many kinds of fish.

Iceland has a tremendous amount of water power which has not been greatly developed. The cities and many isolated farms use power from the waterfalls for electric lights and heating. Water from the hot springs is used for heating the capital of the country and to supply the huge public laundries.

The People and Their Work

Iceland has a total population of 140,968. This gives the country an average population density of only about 3.5 persons to the square mile. Most of the people of Iceland live on the plains of the south and southwestern part of the island, where most of the towns and cities are located. Very few people live in central Iceland, because of its volcanoes and earthquakes, its cold climate, and lack of vegetation.

The Norwegians were the first people who settled in great numbers in Iceland. Their descendants, the Icelanders of today, are much like the early Norsemen. Many Icelanders have fair hair and blue eyes. They are hard-working and thrifty, because hard work and thrift are necessary in order to live in a land with so few natural resources as Iceland, and with such a severe climate.

Most of the houses in Iceland built during the 1900's are of concrete. Wood and turf were used earlier. Icelanders live a simple life. They have few of the luxuries that are taken for granted in many parts of the United States and Canada. On holidays many Icelandic women wear full gathered skirts, topped with snowy satin blouses, embroidered and smocked in bright colors. But generally the clothing in Iceland is much like that worn in American or Canadian cities.

Agriculture. Wheat and other grains will not grow in Iceland because of the short summer season. Some quick-growing vegetables, such as potatoes and turnips, thrive on farms that are sheltered somewhat from the wind. Most of the farms are small and are worked by the people who own the land. The government and many of the schools in Iceland encourage modern farming methods.

The raising of cattle, sheep, goats, and horses is the chief occupation of Icelandic farmers. Dairying was introduced from Denmark and flourishes as a cooperative industry.

Fishing. Many men in Iceland earn their living by fishing off the coasts of the island. The chief kinds of salt-water fish caught are cod and herring. Icelandic waters are so rich in fish that fishermen from many countries gather around the fishing grounds. The average yearly catch amounts to about 7,300 pounds for every person living in Iceland.

Manufactures. Iceland has few factories. The long thick wool of the sheep is shorn and woven into heavy fabrics in small mills, located chiefly near Reykjavik.

Fish is exported fresh on ice in modern steam trawlers, or quick frozen in freezing plants. The old method of drying and salting the fish to keep it from spoiling is fast being replaced by the newer methods of preserving it.

Transportation and Trade. Iceland has no railroads. Transportation is mainly by bus, automobile, and plane. The shaggy ponies raised in Iceland are used for hauling and riding in places that have no roads. The island is connected with other countries by shipping routes and by air lines.

Foreign trade is extremely important to Iceland. Many vegetables and all fruits must be shipped into the country. Most of the coal and all the wood used in Iceland must also be brought in by ships. Fish are shipped chiefly to Great Britain, Germany, Italy, and Spain. Woolen materials also are exported.

Cities. Iceland has few cities of any size. The largest city is the capital Reykjavik, which is described under its own name in THE WORLD BOOK ENCYCLOPEDIA.

Social and Cultural Achievements

Education. Iceland has a high rate of literacy. All children who live in settled communities attend school from the time they are seven until they are fourteen. Teachers travel from farm to farm to teach children who can not reach the schools. The University of Iceland was founded in Reykjavik in 1911. Tuition is free. Iceland also has a commercial college, an industrial school, a navigation school, and agricultural colleges.

Most of the people in Iceland like to read. They read their own Icelandic literature, and the classic and modern writings of the world. They also take great interest in current events. Icelanders speak the Icelandic language, which is somewhat like the other Scandinavian languages, and is practically the same as the language spoken by Norsemen one thousand years ago. However, the Icelandic language is not understood by most modern Norwegians.

Religion. The national church of Iceland is the Evangelical Lutheran. Most Icelanders are Lutherans, although there is complete religious freedom.

Recreation. Icelanders like all kinds of winter sports. Many Icelandic children learn to ski and ice skate almost as soon as they learn to walk. Swimming is also a popular sport. People swim throughout the winter in outdoor pools fed by hot springs, where the water stays warm even when snow lies beside the pool. Steam rises from the pools because the air is cooler than the water.

Icelanders are fond of music and dancing. Storytelling whiles away many evenings. Reykjavik and some of the smaller towns have motion-picture theaters.

Government

Iceland has been a republic since June 17, 1944. The president is the executive head of the government. He is assisted by a council of six ministers. Each minister heads a department of state.

The legislative branch of Icelandic government is much like that of the United States. It consists of a parliament called the *Althing*, which was the name of the popular assembly of the first Icelandic republic. The Althing is made up of an upper and a lower house. The members of the Althing are elected by the people of Iceland. All Icelandic men and women may vote after they are twenty-one years of age.

History

Iceland was first settled by political refugees from Norway in the year 874. A republic was founded about 930, and the first Althing governed the country. C tianity was introduced and officially adopted b Althing in the year 1000.

The Icelandic republican form of governmen appeared in 1262, when Iceland acknowledge overlordship of the King of Norway. A hundred later the island passed with Norway under the r Denmark, and remained a Danish possession even 1814, in which year Norway was ceded to Swede

England occupied Iceland during the Napol wars, but surrendered it to Denmark in 1815. Ic went through a period of economic and social imp ments during the 1800's. Icelanders began to wan to obtain a greater degree of home rule than the i had known since the time of its first republic.

The blockade of World War I interrupted the nection between Denmark and Iceland. In Dece 1918, Denmark recognized Iceland as an indepe country. But the King of Denmark continued to b the King of Iceland.

The Althing chose a regent to serve as head of after Denmark was occupied by German troo April, 1940. In May of that year Iceland was occ by British troops in order to forestall a German s of the island. British troops were replaced by Am troops in July, 1941.

In May, 1944, a direct vote by the people of Ic indicated their almost unanimous desire to est the Republic of Iceland. The republic was off proclaimed on June 17, 1944.

In 1946, Iceland signed an agreement wit United States by which the few remaining Am troops were withdrawn. The United States was perm to continue using the Keflavik airport. In the same Iceland joined the United Nations. The island re signed the North Atlantic treaty in 1949. In accor with this treaty, United States troops took over t fense of the country in 1951. G.LE. and

Related Subjects. The reader is also referred to:

Flag (color plate, Flags of Europe)	Hekla	Saga
Geyser	Krona	Snorri Sturluso
Glacier	Reykjavik	Volcano

Questions

Why is Iceland sometimes called the "Land o and Fire"?

How early did a republican form of govern begin in Iceland?

How was the land of the island built up?

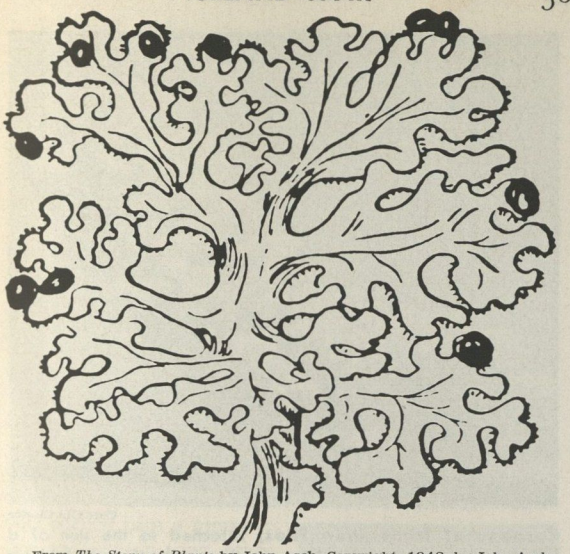
What famous volcano in Iceland is still activ

What are some of the uses Icelandic people m of the water from hot springs?

What circumstances have made the people of land hard-working and thrifty?

Why is trade especially important to Icel

ICELAND MOSS is a lichen, or a plant made u fungus and an alga. It is not a true moss. Icelan grows commonly in Iceland and in the mounta gions of northern countries such as Scotland, N and North America. It grows about one and o to four inches high and looks like moss. It is u food in Iceland, where it is dried, powdered, and into bread or boiled with water and milk. Icelan is used in industry in weaving and in the manu of paper. See also LICHEN.



From *The Story of Plants* by John Asch. Copyright, 1948, by John Asch. Courtesy of G.P. Putnam's Sons.

The Iceland Moss Plant varies in color from chestnut to grayish white. The leaves are tube-shaped and flatten out at the fringed edges. Iceland moss is an easily digested food.

Classification. Iceland moss, *Cetraria islandica*, belongs to the family *Parmeliaceae*.

ICELAND SPAR. See CALCITE.

ICE PACK. When the surface of sea water freezes it forms an ice sheet, or ice field. When the wind blows toward the shore strongly, it breaks up the ice field and piles the blocks of ice on the shore in an ice pack.

ICE PATROL, INTERNATIONAL. This organization was formed to protect ships from icebergs by patrolling the North Atlantic. Its work is done by the United States Coast Guard, which informs ships of the location of icebergs by radio. The Ice Patrol was formed after the sinking of the *Titanic*, which struck an iceberg in 1912 and went down with 1,517 people aboard. The patrol's greatest activity is in the early spring, when the great ice floes to the north begin to break up and drift southward. The work of the patrol has been very successful. No large ship has been lost while the International Ice Patrol was in operation. On March 20, 1943, during the war period when no patrol was being maintained, one merchant vessel was sunk after colliding with an iceberg, and a number of lives were lost. F.R.E.

See also ICEBERG (Ice Patrols).

ICE SHEET. See ICE AGE.

ICE SKATING. See SKATING.

ICE YACHTING, *YAHT ing.* Since ancient times, men have used wind and sail to speed across the ice in boats on runners. This sport is popular today in the United States and Canada, and in most northern countries of the world. Even China and Japan have ice yachting.

The first real ice yacht in America was built by Oliver Booth in 1790. Ice-yachting contests were held that year on the Hudson River. The original iceboat was merely a square box with an ordinary skate on each side. Another skate at the back served as a rudder.

Commodore James B. Weaver startled the people of New Jersey in 1885 by making a speed of 107 miles per hour on the Shrewsbury River in his ice yacht. This speed was the fastest that man ever traveled in any vehicle up to that time.

The modern, speedy ice yacht has a long body similar to that of an airplane. It has three runners, and a spread of sail. Since lightness is very important, the runners usually have aluminum tops and stainless steel inserts. The box for passengers may be of any convenient size and shape. Masts and spars are generally hollow, and the rigging is of steel wire. Most woodwork is made of spruce. The modern ice yacht can attain a speed of 140 miles an hour, and more in record runs. An unofficial speed of 163 miles per hour was reached in 1938. With a forty-mile wind, an ice yacht can maintain an average speed of 100 miles an hour.

There are three main types of ice yachts. Those with rear-steering devices are known as stern steerers. Those with front-steering devices are called front steerers. The

Burroughs, Black Star

This Ice Yacht Steers by the Rear Runner. The tiller extends into the shallow cockpit where the crew of two men ride. Steel cables brace the crossbar and support the tall mast against the great strain of the sail.

H. Armstrong Roberts

Swooping by at High Speed, this ice yacht lifts a runner as a puff of wind strikes the sail. The man at the left is steering. The other controls the sail.

third type has four runners. Small, inexpensive boats called scooters have also made ice yachting possible for many people. E.D.M.

ICHNEUMON, *ick NYOO mahn.* The ichneumon is a small flesh-eating animal that looks like a weasel. It belongs to the civet family. Its name comes from a Greek word that means "*one who tracks.*" This name comes from the animal's habit of seeking out the eggs of crocodiles.

The best-known species of ichneumon lives in Egypt. Foreign residents there call it *Pharaoh's rat.* It is covered with long, wiry, grayish-yellow fur, and its feet, tail, and muzzle are black. This animal feeds on rats, mice, birds, and reptiles. It especially likes poultry and their eggs. The Egyptians have a high regard for the ichneumon, because it keeps down the number of crocodiles. When the Nile River overflows, the ichneumon sometimes enters the homes of men. Usually it wanders in the fields and along riverbanks.

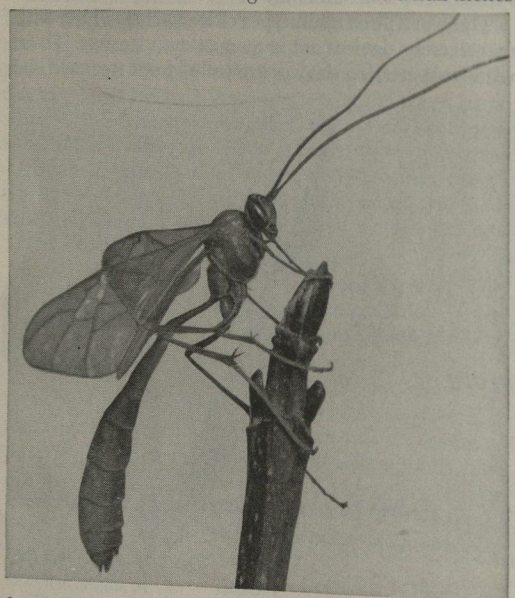
The *mongoose* is an Indian relative of the ichneumon. It is smaller than the African species and has pale gray fur. The mongoose performs a valuable service in India by killing snakes. See also MONGOOSE. H.E.A.

Classification. Ichneumons belong to the family *Viverridae.* The Egyptian species is *Herpestes ichneumon.*

ICHNEUMON FLY. The ichneumon fly is an insect whose larva is a parasite, living on another insect. Although many insects have larvae which are parasites on other insects, ichneumon flies have larvae which can reach wood-boring insects.

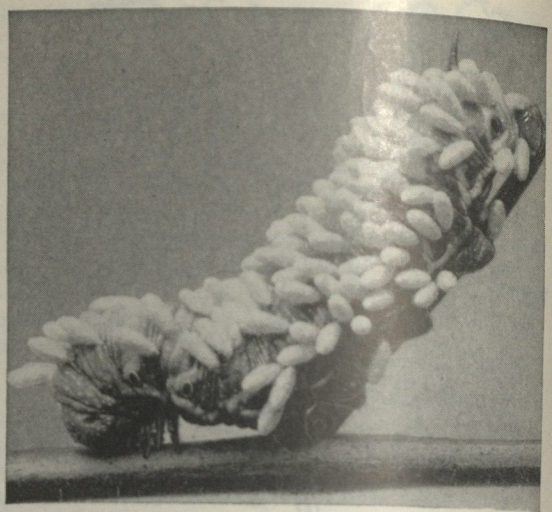
There are thousands of species of these insects. They belong to the same order as bees and wasps. They are not true flies, since they have four membranous wings. Flies have only two wings. Ichneumon flies vary greatly in size. Some are no larger than a small ant, while others are several inches long.

The most interesting genus is perhaps *Megarhyssa.* The largest of these insects grow to two and a half inches in body length. The female's body ends in a pointed drill, or *ovipositor,* which may be four inches long. This organ is made of three parts, like threads. The insect can fit these parts together to form a tube. She uses this tube to place her eggs inside a tree. First she must bore a hole in the tree trunk. To drill this hole, she throws the ovipositor over her back in a loop, and uses her body as a derrick. It is not certain whether she can drill through solid wood, or must follow tiny cracks. It seems probable that she must use the cracks. Occasionally the insect pushes her ovipositor into the wood so tightly that she cannot withdraw it. She is held there a captive, and dies of starvation.



Edwin Way Teale

An Adult Ichneumon Fly. This insect looks somewhat like a mosquito, but it has four wings instead of the mosquito's two. It is more closely related to the family of bees and wasps.



Cornelia Clarke

Cocoons of Ichneumon Flies, attached to the skin of a tomato-sphinx caterpillar. They are the result of eggs laid by a female ichneumon fly in the body of the caterpillar. When the eggs hatched, the ichneumon larvae ate the tissues of the living caterpillar. When full-grown, they worked their way through the caterpillar's skin to spin their cocoons outside its body. Adult ichneumon flies will emerge from the cocoons, but the caterpillar will die before becoming a sphinx moth. Many kinds of ichneumon flies are of great value to farmers because they destroy insect pests in this way.

The drilling proceeds until the ovipositor reaches the burrow of a certain wood-boring insect. Here the fly deposits an egg. When the larva hatches from this egg, it creeps through the burrow until it reaches its victim. It then kills this insect by sucking its blood. The larva remains in the tree until it has grown to be an adult fly.

Ichneumon flies are important to farmers because they feed on many insects that destroy plants. They eat insects in all stages, from eggs to adults. Ichneumon flies destroy caterpillars especially, but some attack the larvae of certain beetles, flies, and wasps. C.D.D.

See also PARASITE.

Classification. Ichneumon flies belong to the order *Hymenoptera,* in which they make up the family *Ichneumonidae.*

ICHTHYOL, *ICK thih ohl,* is the trade name of a drug which is prepared from certain hydrocarbon, or mineral, shales. It is a dark-brown, thick liquid. Ichthyol gets its name from the scientific name for fish, because the shale contains fossil remains of fishes. Ichthyol is prepared by distilling the shale, treating with sulfur, and neutralizing

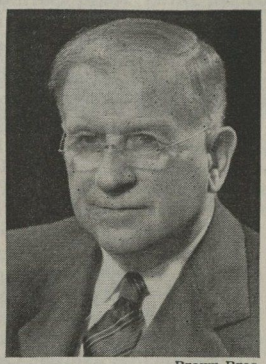
it. Ichthyol, which is really ichthyolsulfonate, is used as a mild antiseptic and as a softening, or soothing, skin preparation. It is also used in treating boils. A.E.S.

ICHTHYOLOGY, *ICK thih AHL oh jih*, is the branch of zoology, or the science of animals, that deals with fishes. This science consists of the study of the development, structure, and habits of fishes, of the classification of the numerous kinds of fishes, of their geographical distribution, and of the mutual relations existing between fishes and their environment. It also includes aspects of their importance to man, such as fisheries and the conservation of food and game fishes. See also FISH; FISHERY; FOSSIL (Fossil Animals). L.B.A.

ICHTHYORNIS, *ICK thih AWR nihs*. See BIRD (Ancestors of Birds).

ICHTHYOSAUR, *ICK thih oh SAWR*. See FOSSIL (Reptiles).

ICKES, *ICK ehs*, **HAROLD L.** (1874-1952), held the post of United States Secretary of the Interior longer than any man before him. President Franklin D. Roosevelt named him a member of his cabinet in 1933. Ickes resigned early in 1946, after a public outburst against President Harry S. Truman. Ickes had been asked to testify before a Senate committee on the nomination of Edwin A. Pauley as Assistant Secretary of the Navy. Ickes accused Pauley of having mixed politics with the handling of Federal oil land. Truman said that Ickes could have been mistaken. After resigning, Ickes wrote a newspaper column for a time.



Brown Bros.

Harold Ickes was Secretary of the Interior from 1933 to 1946.

Ickes was noted for his sharp and acid comments on people in public life. He made many enemies by championing the public ownership of natural resources.

Ickes was born in Blair County, Pennsylvania. He was graduated from the University of Chicago, and later practiced law and worked as a newspaperman. He entered politics when a young man, first as a Republican, then as a Progressive, and finally as a Democrat. Ickes was head of the Public Works Administration during the depression years, oil administrator under the National Recovery Administration, and petroleum and coal administrator during World War II; as well as co-ordinator of fisheries. G.S.B.

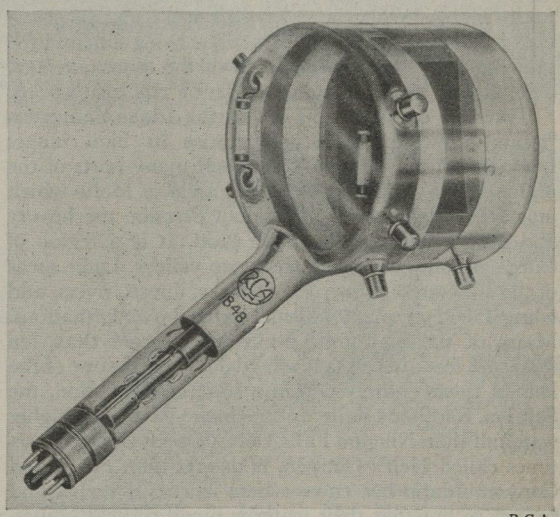
ICON, *I kahn*, or **EIKON,** is a religious picture, usually painted on a flat surface such as wood or ivory. Icons in the Greek Orthodox churches are the pictures of Christ, the Virgin Mary, or the saints. Before the Bolshevik revolution in Russia, icons were placed in the churches and taken with armies into battle. The pictures could be reverenced highly, but the only image which could be adored was that of Christ. M.M.D.

ICONOCLAST, *eye KAHN oh klast*, is a person who attacks long-established beliefs. The word comes from two Greek words, *eikōn* and *klastēs*, which mean *image* and a *breaker*. In the days of the early Christian Church the name was given those people who were against the worship of images. There had long been a dispute dividing the Church, especially in the East, about images of Christ and the saints in churches. Emperor Leo III in 726 issued an order forbidding images and incense. Many images were destroyed, and the Church was divided into opposite groups. The iconoclasts were against the presence of images in churches.

In the Roman Catholic Church, images are venerated as symbols. They are not actually worshiped. M.M.D.

ICONOSCOPE, *eye KAHN oh skohp*, is the name of a cathode-ray tube which first made possible television transmission. It was invented by Vladimir K. Zworykin. The iconoscope is shaped like a light bulb with a thin neck, but it is many times larger.

Light enters the lens of the camera and is focused on a photoelectric surface inside the bulb, which changes the light rays into electrical impulses. This photoelectric surface is made up of tiny light-sensitive beads spread over a sheet of mica. An electron gun is inclosed in the neck of the bulb. It sprays a stream of electrons across the photoelectric surface. The amount of light which falls on the photoelectric surface causes the



R.C.A.

The Iconoscope Made Television Possible

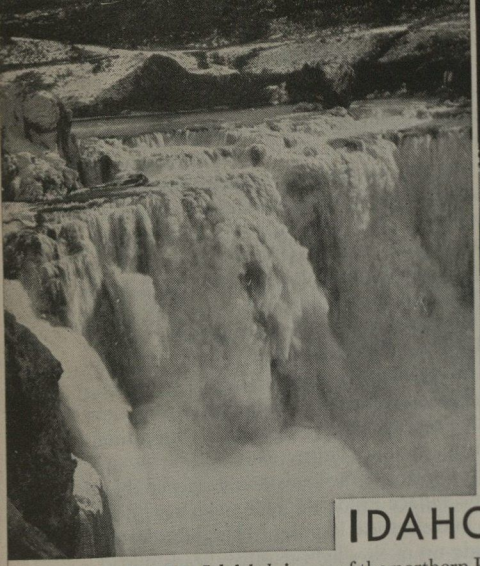
amount of positive electric charge on this mesh to vary. And the beams of light reflected from a picture are changed to electric charges of varying amounts. These charges permit the television picture to be broadcast.

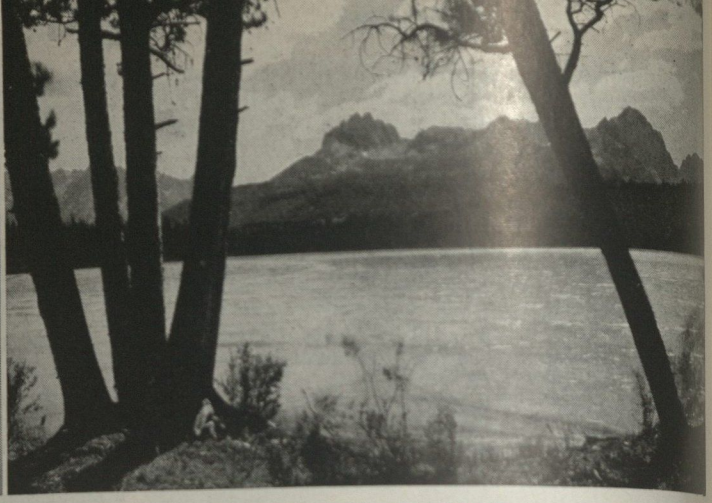
A later invention, the image orthicon, is much smaller than the iconoscope. The image orthicon is also much more sensitive to light and, therefore, does not require as extensive a lighting system as the iconoscope. See also TELEVISION; ZWORYKIN, VLADIMIR K. M.Sc. and V.K.Z.

ICTERUS, *ICK ter us*, is a medical term for jaundice. See JAUNDICE.

ICTINUS, *ick TI nus*. See PARTHENON.

IDA, MOUNT, is the ancient name of Mount Psiloriti, the highest peak (8,195 feet), on the island of Crete. The foot of this mountain was the setting for many stories about early Greek gods. H.U.S.





IDAHO GEM OF THE MOUNTAINS

IDAHO, *I dah hoh,* is one of the northern Rocky Mountain states. It is named from the Shoshone Indian words, *Ee dah how!*, which mean *The sun comes down the mountain,* or *It is morning.* The Indians did well to name this region for the morning. Dawns are startling and beautiful in Idaho. While the valleys are still dark, the snow-clad peaks gleam with the rays of the rising sun, and the growing light moves rapidly down the mountainsides. The popular name of Idaho is GEM OF THE MOUNTAINS.

Travelers of the 1800's called the Idaho country a "mountain-walled solitude" because its high ranges made it almost impossible to reach many parts of the region. Today there remain great areas of Idaho which are still wilderness. Words cannot describe the beauty and grandeur of much of the land. It is a region of extremely tall peaks and very deep valleys. Large areas of the state are a wilderness of rocks, forests, rivers, and lakes. There are many unusual natural rock formations. Many of the mountain peaks tower more than ten thousand feet above sea level. Idaho contains one of the longest rivers entirely within a state of the Union, the Salmon. Shoshone Falls, on the Snake River, is a higher waterfall than Niagara Falls. Seven Devils Gorge, sometimes called Hell's Canyon, is deeper than the Grand Canyon. Idaho has caves where ice never melts, and springs so hot that their water is piped to heat homes.

But not all of Idaho is wilderness. The great forests yield large quantities of lumber. From the mountains are taken minerals of great value, including gold, silver, lead, zinc, and semiprecious stones. The largest phosphate rock deposits in the United States are located in Idaho. The state also has the largest silver mine and the three largest lead mines in the nation.

A large network of irrigation canals carries water from the Snake River and its branches to the dry plains, making the land a rich farming region. Large crops are raised in sandy soil which once grew only sagebrush. The state is famous for its potatoes, sugar beets, and peas. Idaho ranks third among the states in potato production.

The Land and Its Resources

Extent: *Area,* 83,557 square miles (749 square miles of which are inland water), twelfth in size among the states. *Greatest length,* 490 miles; *greatest width,* 305 miles.

Physical Features: *Chief Rocky Mountain ranges,* Beaverhead, Bitter Root, Caribou, Big Hole, Cabinet, Coeur d'Alene, Blackfoot, Lemhi, Lost River, Salmon River, Sawtooth, Seven Devils. *Chief peaks,* Borah, Bell Dorion, Boulder, Hawley, He Devil, Hyndman, Leatherman, Sacagawea, Sawtelle. *Elevation,* highest, Borah Peak in Custer County, 12,665 feet; lowest, Snake River in Nez Percé County, 783 feet. *Chief rivers,* Snake (tributaries, Big Wood, Blackfoot, Boise, Bruneau, Clearwater, Payette, Salmon). *Chief lakes,* Bear, Coeur d'Alene, Grays, Henrys, Pend d'Oreille, Payette, Priest. *Chief waterfalls,* American, Mesa, Perrine Coulee, Shoshone. *Chief mineral springs,* Big Creek, Lava, Magic, Soda.

Climate: *Temperature,* average annual, 45.5°F.; average summer, 64.93°F.; average winter, 26°F.; lowest on record, −57°F. at Tetonia (Feb., 1933); highest on record, 118°F. at Orofino (July, 1934). *Precipitation,* average annual, 17.91 inches; average Apr. 1 to Sep. 30, 6.67 inches; average Oct. 1 to Mar. 31, 11.24 inches. *Snowfall,* average annual, 59 inches.

Location, Size, and Surface Features. Idaho is larger than nine other states together—Rhode Island, Vermont, New Jersey, New Hampshire, Massachusetts, Maryland, West Virginia, Connecticut, and Delaware. The great irregular area that is Idaho was the last state to be created from the Oregon Territory, after all the states around it had fixed their boundaries. Idaho is shaped like a huge easy chair facing east. For the boundaries of Idaho, see the colored map.

The surface of the land is unusually varied. The southern plains are separated from the northern plains by a wide plateau which is broken by rugged mountain ranges.

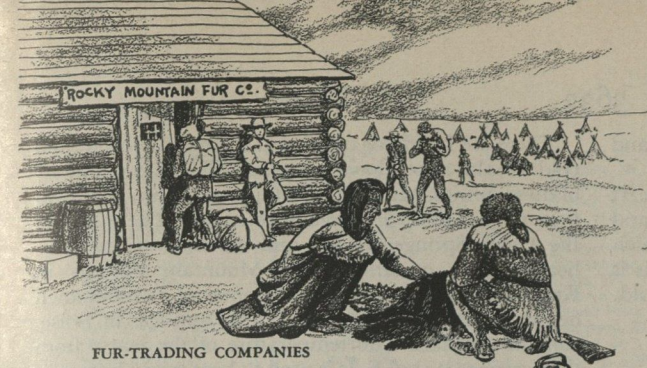
Idaho is divided into four great natural regions, the Panhandle, the Northern Mountain Region, the Snake River Plain, and the Southern Mountain Region.

The *Panhandle Region* gets its name from its shape. This northern region is wedged between Washington and

Pronunciation Guide

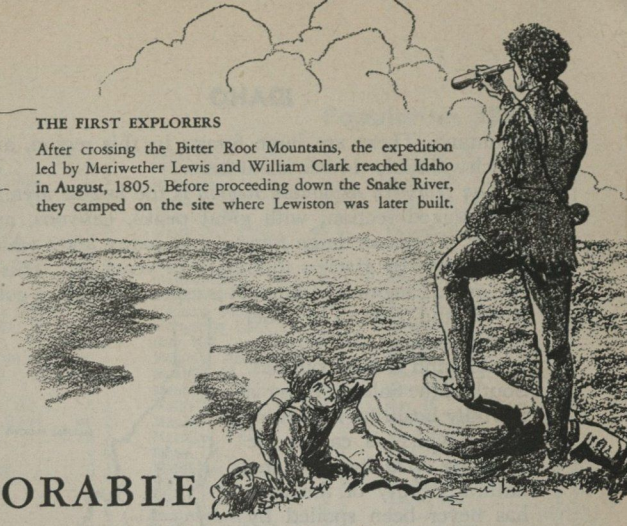
Boise *BOY sih*	Pend d'Oreille *PAHN doh RAY*
Bruneau *BRYOO NOH*	Pocatello *POH kah TELL oh*
Lemhi *LEM high*	Portneuf *port NUFF*
Minidoka *MIN ih DOH kah*	Sacagawea *sah KAH gah WAY ah*
Nez Percé *nez PURZ,* or *nay per SAY*	Shoshone *sho SHO nee*
Owyhee *oh WI hee*	

MEMORABLE IDAHO EVENTS



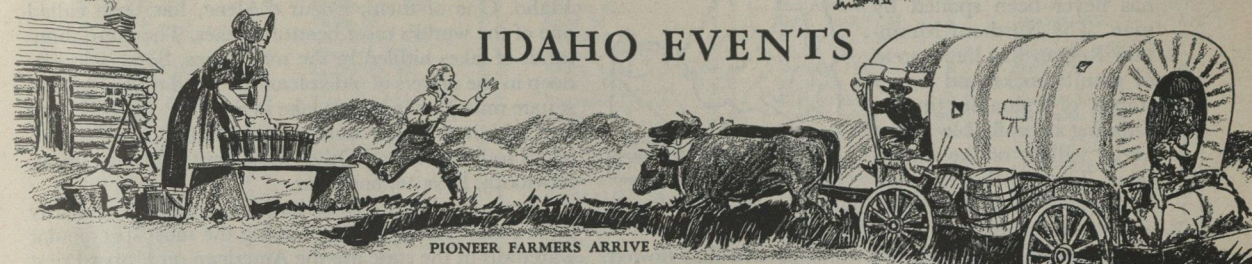
FUR-TRADING COMPANIES

After founding a fur-trading post at Fort Henry in 1810, the Rocky Mountain Fur Company held an annual meeting at Pierre's Hole (Teton Basin), where trappers exchanged pelts for supplies. In 1840, the Hudson's Bay Company is said to have harvested 80,000 pelts along the Snake River.



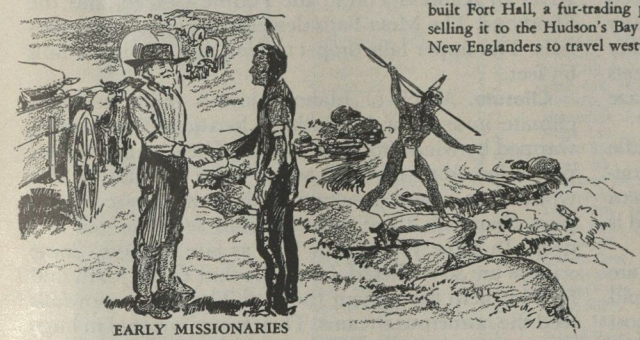
THE FIRST EXPLORERS

After crossing the Bitter Root Mountains, the expedition led by Meriwether Lewis and William Clark reached Idaho in August, 1805. Before proceeding down the Snake River, they camped on the site where Lewiston was later built.



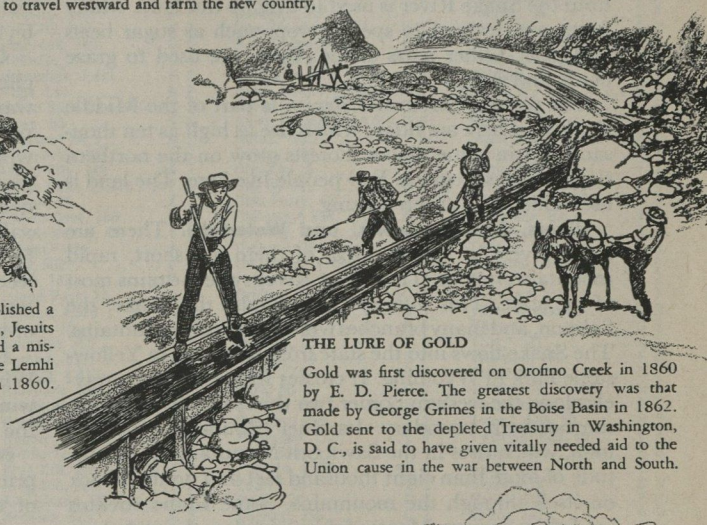
PIONEER FARMERS ARRIVE

In 1834, Nathaniel Wyeth and his company of sixty men built Fort Hall, a fur-trading post on the Snake River. After selling it to the Hudson's Bay Company in 1836, he induced New Englanders to travel westward and farm the new country.



EARLY MISSIONARIES

At Lapwai, where Spalding now stands, Henry Spalding established a school, church, and flour mill in 1836. Near Cataldo, in 1852, Jesuits built the Sacred Heart Mission. Mormons from Utah founded a mission, dug irrigation ditches, started to farm land adjoining the Lemhi River in 1855, and founded a settlement at Franklin in 1860.

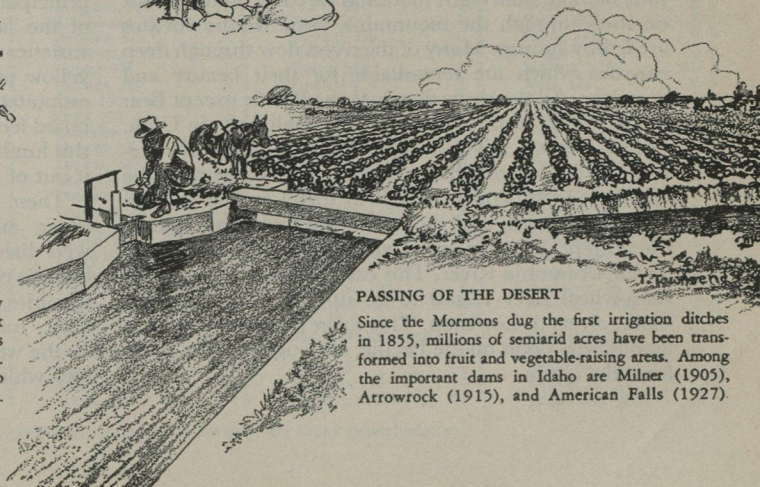


THE LURE OF GOLD

Gold was first discovered on Orofino Creek in 1860 by E. D. Pierce. The greatest discovery was that made by George Grimes in the Boise Basin in 1862. Gold sent to the depleted Treasury in Washington, D. C., is said to have given vitally needed aid to the Union cause in the war between North and South.

INDIAN WAR OF 1877

In 1877, after refusing terms of a new treaty presented by the Government, Chief Joseph, great strategist of the Nez Percés, defeated United States troops at White Bird Canyon and in other skirmishes. Finally, however, he and his people were forced to surrender while attempting a retreat into Canada.

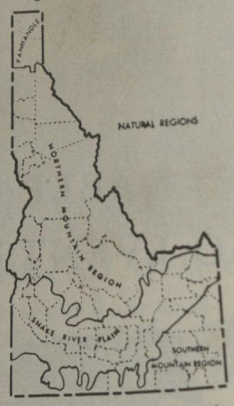


PASSING OF THE DESERT

Since the Mormons dug the first irrigation ditches in 1855, millions of semiarid acres have been transformed into fruit and vegetable-raising areas. Among the important dams in Idaho are Milner (1905), Arrowrock (1915), and American Falls (1927).

Montana. There are large forests in this region, and much valuable timber is cut here.

The *Northern Mountain Region* is the largest area. It is a rugged section, with great peaks, canyons, and ridges. There are large forests, and many lakes which were made by glaciers thousands of years ago. This is the mining region of Idaho. It is especially rich in gold, silver, and zinc. The chief mines are in Shoshone, Lemhi, and Custer counties. South of the Salmon River is a wildly beautiful section of Idaho which is called the *Primitive Area* because the natural beauty of the area has never been spoiled by man. The Northern Mountain Region has large areas of granite rocks and heavy stands of valuable timber. Farming is profitable in the fertile valleys of the mountains. The growing of grain is especially important in Idaho, Lewis, Nez Percé, and Latah counties.



The *Snake River Plain* was made of lava that flowed from a volcano which is now extinct. The lava has been partly covered by wind-blown soil and sagebrush. Water from the Snake River is used to irrigate this land. Many farms are devoted to special crops such as sugar beets and peas. Other parts of the region are used to graze cattle and sheep.

The *Southern Mountain Region* is part of the Middle Rockies. There are ridges which rise as high as ten thousand feet in some places. Forests grow on the northern slopes of these regions. Few people live here. The land is used chiefly for sheep grazing.

Rivers, Springs, Lakes, and Waterfalls. There are many rivers in Idaho. Most of them are short, rapid mountain streams. The Snake River system drains most of the state. This river system includes the Snake, the Salmon, and many branches which rise in the mountains. The Snake flows into the state from its source in Yellowstone Park in Wyoming. It crosses Idaho and then travels along the western border two thirds of the way up to the northern boundary. Its chief tributary is the Salmon, which rises in the Sawtooth Mountains at an altitude of more than eight thousand feet and doubles back on itself through the mountains. Some Idaho streams are fed by springs. Many of the rivers flow through deep canyons which are remarkable for their beauty and grandeur. All the rivers flow into the Pacific except Bear River, which empties into the Great Salt Lake in Utah.

The Salmon River is called "The River of No Return." It flows through one of the longest canyons in the world. It is difficult for boats to travel on the Salmon with the current, and they cannot travel at all against the current. In 1915, the Celilo Canal was completed on the Columbia River. This canal made it possible for stern-wheel river vessels to go up the Columbia and Snake rivers to Lewiston. This town then became what amounts to a port on the Pacific, although it is 480 miles from the ocean.

There are hundreds of mineral springs, both hot and cold. Health resorts have been established around many of these springs. Most of the hot springs obtain their heat from the hot ashes and lava of volcanoes. The waters of Big Creek Springs are hot and are believed to have health-giving qualities. Bald Mountain Springs in Ketchum have been made the center of a well-known health resort. The waters of Warm Springs, in Boise, contain minerals. The temperature of the water from these springs is 170° F. It is used to heat many homes in the city. The Natatorium, an open-air swimming pool, is filled from Warm Springs. The cold Soda Springs are highly charged with carbonic acid gas. Hot springs flow from the walls of Box Canyon.

No one knows exactly how many lakes there are in Idaho. One of them, Coeur d'Alene, has been called one of the world's most beautiful lakes. There are thousands of lakes hidden in the mountains. Some lakes lie deep in the craters of old volcanoes. Pend d'Oreille (180 square miles) is the largest lake in the state. Camp Farragut, a United States naval training station, was located on its southern shore. Other important lakes are Priest, Sawtooth, Payette, and Bear.

There are hundreds of large waterfalls and many more small ones in Idaho. Among the most spectacular waterfalls in the state are the American on Upper Priest River in Kaniksu Forest, the Perrine Coulee, and the Shoshone. The Mesa Falls descend in two lovely waterfalls. The upper falls drop 114 feet, and the lower falls 65 feet.

Climate. Much of Idaho enjoys a mild, healthful climate in spite of its northern location. The state is warmed by winds from the Pacific. The mountains give protection from the cold winds from the north. The winters are severe, however, within the mountain region. Snowfalls there measure from seven to ten feet deep. In some years, snow falls as late as June. Some valleys are so sheltered, however, that cattle roam and feed in them throughout the year. The heavy snowfalls feed the numerous streams. Their water is stored in huge reservoirs to irrigate the southern and central portions of the state, which receive little rain.

Idaho averages about 260 days of sunshine yearly. Winter winds are from the east and southeast. Summer winds blow from the east in northern Idaho, and from the northwest and southeast in the southern part.

Natural Resources. Forests, mines, and waters are the principal natural resources of the state. Idaho has some of the largest white-pine forests in the world. Other varieties of trees include the gigantic red (Douglas) fir, yellow pine, spruce, birch, willow, and hemlock. It is estimated that there are more than 66,000,000,000 board feet of lumber in the forests of Idaho. But much of this lumber cannot be cut because it is too hard to haul it out of the mountains.

There are valuable deposits of phosphate rock, lead, silver, and zinc in the state. Supplies of vanadium were discovered in 1942. Other sources of mineral wealth include coal, limestone, sandstone, shale, asbestos, talc, graphite, and salt. Small quantities of antimony, arsenic, tungsten, cobalt, and nickel have been tapped. In the western part of the state are beds of silica, a fine rock which is used in making brick and insulation. Gem

IDAHO

Counties

Ada, 70,649 ..... F 2
Adams, 3,347 ..... E 2
Bannock, 41,745 ..... G 6
Bear Lake, 6,834 ..... G 7
Benewah, 6,173 ..... B 2
Bingham, 23,271 ..... F 6
Blaine, 5,384 ..... F 4
Boise, 1,776 ..... F 3
Bonner, 14,853 ..... A 2
Bonneville, 30,210 ..... F 7
Boundary, 5,908 ..... A 2
Butte, 2,722 ..... F 5
Camas, 1,079 ..... F 4
Canyon, 53,597 ..... F 2
Caribou, 5,576 ..... G 7
Cassia, 14,629 ..... G 5
Clark, 918 ..... E 6
Clearwater, 8,217 ..... C 3
Custer, 3,318 ..... E 4
Elmore, 6,687 ..... F 3
Franklin, 9,867 ..... G 7
Fremont, 9,351 ..... E 7
Gem, 8,730 ..... E 2
Gooding, 11,101 ..... F 4
Idaho, 11,423 ..... D 3
Jefferson, 10,495 ..... F 6
Jerome, 12,080 ..... G 4
Kootenai, 24,947 ..... B 2
Latah, 20,971 ..... C 2
Lemhi, 6,278 ..... E 4
Lewis, 4,208 ..... C 2
Lincoln, 4,256 ..... G 4
Madison, 9,156 ..... F 7
Minidoka, 9.785 ..... G 5
Nez Perce, 22,658 ..... C 2
Oneida, 4,387 ..... G 6
Owyhee, 6,307 ..... G 2
Payette, 11,921 ..... E 2
Power, 3,988 ..... G 6
Shoshone, 22,806 ..... B 3
Teton, 3,204 ..... F 7
Twin Falls, 40,979 ..... G 4
Valley, 4,270 ..... E 3
Washington, 8,576 ..... E 2

Cities

○ Indicates County Seat

Aberdeen, 1,486 ..... G 6
Acequia, 110 ..... G 5
Addie, 100 ..... A 2
Ahsahka, 150 ..... C 2
Alameda, 4,694 ..... G 6
Albion, 610 ..... G 5
Almo, 310 ..... G 5
Alpha, 10 ..... E 2
Alpine, 150 ..... F 7
American Falls, 1,874 ..○G 6
Ammon, 447 ..... F 7
Amsterdam, 70 ..... G 4
Anderson Dam, 568 ..... F 3
Arbon, 55 ..... G 6
Archer, 300 ..... F 7
Arco, 961 ..... ○F 5
Arimo, 337 ..... G 6
Arling, 18 ..... E 2
Ashton, 1,256 ..... E 7
Athol, 226 ..... B 2
Atlanta, 35 ..... F 3
Avery, 280 ..... B 3
Avon, 25 ..... C 2
Baker, 100 ..... D 5
Bancroft, 495 ..... G 7
Banks, 50 ..... E 2
Basalt, 227 ..... F 6
Bayhorse, 25 ..... E 4
Bayview, 136 ..... B 2
Bear, 47 ..... D 2
Bellevue, 528 ..... F 4
Benning, 100 ..... G 5
Bennington, 250 ..... G 7
Berenice, 25 ..... F 6
Besslen, 60 ..... G 4
Big Creek, 45 ..... D 3
Big Springs, 10 ..... E 7
Blackfoot, 5,180 ..... ○F 6
Blanchard, 150 ..... A 2
Bliss, 126 ..... G 4
Bloomington, 302 ..... G 7
Boise, 34,393 ..... ○F 2
Boles, 15 ..... D 2
Bone, 40 ..... F 7
Bonners Ferry, 1,776 ..○A 2
Bovill, 437 ..... C 2
Bowmont, 87 ..... F 2
Bridges, 75 ..... G 5
Bruneau, 300 ..... G 3
Buhl, 2,870 ..... G 4
Burgdorf, 10 ..... D 3
Burke, 800 ..... B 3
Burley, 5,924 ..... ○G 5
Burton, 300 ..... F 7
Cabinet, 75 ..... A 2
Calder, 55 ..... B 2
Caldwell, 10,487 ..... ○F 2
Camas, 30 ..... E 6
Cambridge, 354 ..... E 2
Canfield, 6 ..... D 2
Carey, 100 ..... F 5
Carmen, 40 ..... D 5
Cascade, 943 ..... ○E 2
Castleford, 265 ..... G 4
Cavendish, 75 ..... C 2
Cedarhill, 82 ..... G 6
Central, 133 ..... G 7
Challis, 728 ..... ○E 4
Chatcolet, 92 ..... B 2
Chester, 275 ..... F 7
Chesterfield, 196 ..... G 7
Chilly, 60 ..... E 5
Chubbuck,* 120 ..... G 6
Churchill, 200 ..... G 5
Clark Fork, 387 ..... A 2
Clarkia, 75 ..... C 2
Clarkville,* 19 ..... B 2
Clawson, 120 ..... F 7
Clayton, 100 ..... E 4
Cleveland, 243 ..... G 7
Cliffs, 10 ..... G 2
Clifton, 201 ..... G 7
Clover, 20 ..... D 4
Clover, 49 ..... G 4
Cocolalla, 90 ..... A 2
Coeur d'Alene, 12,198 ○B 2
Colburn, 100 ..... A 2
Coolin, 100 ..... A 2
Copeland, 15 ..... A 2
Corral, 3 ..... F 4
Cottonwood, 673 ..... C 2
Council, 748 ..... ○E 2
Craigmont, 594 ..... C 2
Crouch, 25 ..... E 3
Crystal, 115 ..... G 6
Culdesac, 175 ..... C 2
Cuprum, 20 ..... D 2
Czizek, 200 ..... D 3
Dalby,* 13 ..... F 7
Darlington, 100 ..... F 5
Dayton, 287 ..... G 7
Deary, 320 ..... C 2
Declo, 219 ..... G 5
De Lamar, 35 ..... F 2
Dietrich, 160 ..... G 4
Dingle, 300 ..... G 7
Dixie, 50 ..... D 3
Donnelly, 200 ..... E 2
Dover, 226 ..... A 2
Downey, 748 ..... G 6
Driggs, 941 ..... ○F 7
Drummond, 59 ..... E 7
Dubois, 430 ..... ○E 6
Duthie, 200 ..... B 3
Dwight, 100 ..... F 7
Eagle, 250 ..... F 2
East Hope,* 149 ..... A 2
Eastport, 40 ..... A 2
Eaton, 20 ..... E 1
Eddiville,* 10 ..... B 2
Eden, 456 ..... G 4
Elba, 250 ..... G 5
Elk City, 180 ..... D 3
Elk River,* 312 ..... C 3
Ellis, 100 ..... E 4
Elmira, 43 ..... A 2
Emida, 150 ..... B 2
Emmett, 3,067 ..... ○F 2
Fairfield, 502 ..... ○F 4
Fairview,* 398 ..... G 7
Featherville, 12 ..... F 3
Felt, 50 ..... F 7
Fenn, 30 ..... D 2
Ferdinand, 206 ..... C 2
Fernwood, 150 ..... B 2
Filer, 1,425 ..... G 4
Firth, 293 ..... F 6
Fish Haven, 210 ..... G 7
Forney, 9 ..... E 4
Fort Hall, 200 ..... F 6
Franklin, 467 ..... G 7
Franklin-Whitney-Airport,* 7,809 (suburb of Boise) ..... F 2
French Creek, 50 ..... D 2
Fruitland, 573 ..... F 2
Fruitvale, 150 ..... E 2
Gannett, 67 ..... F 4
Gardena, 38 ..... F 2
Garden City,* 764 ..... F 2
Garden Valley, 32 ..... E 3
Gem, 250 ..... B 3
Genesee, 552 ..... C 2
Georgetown, 404 ..... G 7
Gibbonsville, 200 ..... D 5
Gibbs, 277 ..... B 2
Gilmore, 50 ..... E 5
Glenns Ferry, 1,515 ..... G 3
Glenwood, 35 ..... C 3
Golden, 44 ..... D 3
Gooding, 3,099 ..... ○G 4
Goodrich, 12 ..... E 2
Grace,* 761 ..... G 7
Granaemont, 160 ..... C 2
Grangeville, 2,544 ..... ○D 2
Granite, 151 ..... A 2
Grant, 350 ..... F 6
Grasmere, 20 ..... G 3
Gray ..... F 7
Greer, 111 ..... C 2
Grouse, 40 ..... F 5
Guild, 50 ..... E 7
Gwenford, 50 ..... G 6
Hagerman, 520 ..... G 4
Hailey, 1,464 ..... ○F 4
Hamer, 50 ..... F 6
Hammett, 234 ..... G 3
Hansen, 463 ..... G 4
Harpster, 40 ..... D 3
Harrison, 322 ..... B 2
Hauser Lake,* 70 ..... B 2
Hawkins, 65 ..... G 6
Hayden Lake, 39 ..... B 2
Hazelton, 429 ..... G 4
Headquarters, 100 ..... C 3
Heath, 3 ..... E 2
Heglar, 10 ..... G 5
Heise,* 87 ..... F 6
Helmer, 50 ..... C 2
Henry, 22 ..... G 7
Heyburn, 539 ..... G 5
Hibbard, 445 ..... F 7
Hill City, 100 ..... F 3
Holbrook, 240 ..... G 6
Hollister, 80 ..... G 4
Homedale, 1,411 ..... F 2
Hope, 111 ..... A 2
Horse Shoe Bend, 401 ..F 2
Howe, 50 ..... F 6
Huetter,* 84 ..... B 2
Humphrey, 40 ..... E 6
Idaho City, 246 ..... ○F 3
Idaho Falls, 19,218 ..○F 6
Idmon, 25 ..... E 7
Indian Cove, 100 ..... G 3
Indian Valley, 40 ..... E 2
Inkom,* 434 ..... G 6
Iona, 502 ..... F 7
Irwin, 147 ..... F 7
Island Park, 24 ..... E 7
Jerome, 4,523 ..... ○G 4
Joseph, 10 ..... D 2
Juliaetta, 365 ..... C 2
Kamiah, 812 ..... C 2
Kellogg, 4,913 ..... B 2
Kendrick, 409 ..... C 2
Ketchum, 757 ..... F 4
Keuterville, 68 ..... C 2
Kilgore, 116 ..... E 7
Kimberly, 1,347 ..... G 4
King Hill, 100 ..... F 3
Kingston, 200 ..... B 2
Klockmann, 80 ..... A 2
Kooskia, 629 ..... C 3
Kootenai, 199 ..... A 2
Kuna,* 534 ..... F 2
Laclede, 200 ..... A 2
Lago, 160 ..... G 7
Lake, 100 ..... E 7
Lakeview, 35 ..... B 2
Lamont, 55 ..... F 7
Lapwai, 480 ..... C 2
Lava Hot Springs, 591 ..G 6
Leadore, 159 ..... E 5
Leesburg, 20 ..... D 4
Lemhi, 32 ..... E 5
Leonia, 21 ..... A 2
Leslie, 40 ..... F 5
Letha, 81 ..... F 2
Lewiston, 12,985 ..... ○C 2
Lewisville, 402 ..... F 6
Liberty, 225 ..... G 7
Lincoln, 250 ..... F 6
Lost River,* 37 ..... E 4
Lowell, 15 ..... C 3
Lowman, 20 ..... E 3
Lucile, 20 ..... D 2
Lund, 120 ..... G 7
McCall, 1,173 ..... E 2
McCammon,* 578 ..... G 6
McGuires, 240 ..... B 2
Mackay, 760 ..... F 5
Malad City, 2,715 ..... ○G 6
Malta, 235 ..... G 5
Marble Creek, 15 ..... B 2
Marion, 200 ..... G 5
Marsh Valley, 100 ..... G 6
Marsing, 643 ..... F 2
Marysville, 190 ..... E 7
May, 100 ..... E 5
Mayfield, 100 ..... F 3
Meadow, 38 ..... A 2
Meadows, 150 ..... E 2
Melba, 203 ..... F 2
Menan, 430 ..... F 7
Meridian, 1,810 ..... F 2
Mesa, 150 ..... E 2
Middleton, 496 ..... F 2
Midvale, 231 ..... E 2
Mineral, 11 ..... E 1
Minidoka, 113 ..... G 5
Mink Creek,* 124 ..... G 7
Montpelier, 2,682 ..... G 7
Moore, 256 ..... F 5
Moravia, 110 ..... A 2
Moreland, 400 ..... F 6
Morton, 35 ..... A 2
Moscow, 10,593 ..... ○C 2
Mountain Home, 1,887 ○F 3
Mountain View,* 3,084 (suburb of Boise) ... F 2
Mount Idaho, 55 ..... D 2
Moyie Springs, 109 ..... A 2
Muldoon, 35 ..... F 5
Mullan, 2,036 ..... B 3
Murphy, 100 ..... ○F 2
Murray, 250 ..... B 3
Murtaugh, 239 ..... G 4
Naf, 90 ..... G 5
Nampa, 16,185 ..... F 2
Naples, 100 ..... A 2
Newdale, 312 ..... F 7
New Meadows, 621 ..... E 2
New Plymouth, 942 ..... F 2
Nezperce, 543 ..... ○C 2
Nordman, 90 ..... A 2
North Bonners, 100 ..... A 2
North Fork, 20 ..... D 5
North Pocatello,* 575 ..G 6
Notus,* 313 ..... F 2
Oakley, 684 ..... G 5
Obsidian, 5 ..... F 4
Ola, 34 ..... E 2
Olds Ferry, 30 ..... E 1
Oldtown,* 358 ..... A 2
Onaway, 425 ..... C 2
Orchard, 75 ..... F 2
Orchards,* 4,494 (suburb of Lewiston) ..C 2
Orofino, 1,656 ..... ○C 2
Orogrande, 50 ..... D 3
Osburn, 800 ..... B 3
Owyhee, 25 ..... F 2
Oxford, 110 ..... G 7
Paris, 774 ..... ○G 7
Park, 40 ..... C 2
Parker, 306 ..... F 7
Parma, 1,369 ..... F 2
Patterson, 112 ..... E 5
Paul, 560 ..... G 5
Payette, 4,032 ..... ○E 2
Pearl,* 38 ..... E 2
Peck, 170 ..... C 2
Pegram, 156 ..... C 7
Picabo, 100 ..... F 4
Pierce, 544 ..... C 3
Pine View, 3 ..... E 7
Pingree, 53 ..... F 6
Placerville, 17 ..... F 3
Plano, 400 ..... F 7
Plummer, 395 ..... B 2
Pocatello, 26,131 ..... ○G 6
Polaris,* 214 ..... B 3
Ponderay,* 248 ..... A 2
Post Falls, 1,069 ..... B 2
Potlatch, 1,105 ..... C 2
Prairie, 125 ..... F 3
Preston, 4,045 ..... ○G 7
Priest River, 1,592 ..... A 2
Princeton, 100 ..... C 2
Rathdrum, 610 ..... B 2
Rea, 75 ..... E 7
Red River Hot Springs, 20 ..... D 3
Reno, 36 ..... E 6
Reubens, 116 ..... C 2
Rexburg, 4,253 ..... ○F 7

○ Indicates County Seat. * Place names marked by an asterisk do not appear on the map. Key shows general location.

Population

Reynolds, 20
Richfield, 42
Riddle, 12.
Ridgedale, 1
Rigby, 1,826
Riggins, 287
Ririe, 527..
Roberts,* 34
Robin, 50..
Rockland, 2
Rocky Bar,
Rogerson, 7
Roseberry, 5
Roselake, 1
Roseworth,
Roswell, 60
Roy, 10 ....
Rupert, 3,09
St. Anthony
St. Charles,
St. Joe, 200
St. Maries,
Salem, 400
Salmon, 2,6
Samaria, 32
Sanders, 50
Sandpoint,
Santa, 150.
Shelley, 1,8
Shelton, 30
Shoshone, 1
Silver City,
Silverton, 2
Slate Creek
Small, 2....
Smelterville
Smiths Ferr
Soda Spring
South Boise
Southwick,
Spalding, 15
Spencer, 70
Spirit Lake,
Springfield,
Stanley, 33
Star, 410..
State Line,*
Sterling, 15
Stibnite, 71
Stites, 227.
Stone, 150.
Sublett, 140
Sugar, 684.
Sunbeam, 1
Sunnydell,
Sun Valley,
Swan Valle
Tamarack,
Tenday, 20
Tensed, 189
Terreton, 5
Teton, 463.
Tetonia,* 2
Three Creek
Triangle, 5
Troy,* 531.
Triumph, 1
Tuttle, 17.
Twin Falls,
Twin Grove
Twin Lakes
Twin Sprin
Tyhee, 100
Ucon, 356.
Ulysses, 50
Ustick, 200
Victor, 431.
Virginia, 25
Wallace, 3,1
Wapi, 22..
Wardner, 7
Warren, 10
Wayan, 96.
Weippe, 1,2
Weiser, 3,9
Wendell, 1,
West Boise
Westlake, 5
Weston, 38
White Bird
White Knob
Wilder, 555
Wildhorse,
Winchester
Winsper, 4
Woodland,
Woodruff, 1
Woodville,
Worley, 233
Yellow Pine

IDAHO
1 Inch = 41.5 Statute Miles
Miles 10 0 10 20 30
State Capital
County Seat
Size of symbols and type indicates relative population
Lambert Conformal Conic Projection
RELIEF
Feet
5 000
2 000
1 000
500
100
Sea Level
Below Sea Level
500
5 000
COSMO RELIEF IDAHO
Copyright by RAND MCNALLY & COMPANY
Made in U. S. A.
Longitude West of Greenwich
BRITISH COLUMBIA
CANADA
UNITED STATES
ALTA.
Spokane
Coeur d'Alene
Lewiston
Moscow
Boise
Caldwell
Nampa
Meridian
Twin Falls
Pocatello
Idaho Falls
Blackfoot
Rexburg
Burley
Mountain Home
Hailey
Ketchum
Sun Valley
Salmon
Lewiston
Orofino
Grangeville
Kamiah
Kellogg
Wallace
Mullan
Sandpoint
Bonners Ferry
Priest River
Libby
Kalispell
Whitefish
Polson
Ronan
Missoula
Bozeman
Livingston
Great Falls
Fort Benton
Helena
East Helena
Butte
Anaconda
Dillon
Lewistown
Malta
Glasgow
Havre
Shelby
Conrad
Choteau
Cut Bank
Browning
Valier
Pendroy
Agawam
Black Eagle
Vaughn
Augusta
Stanford
Belt
Harlowton
Ryegate
Roundup
Lolo
Hamilton
Darby
Philipsburg
Deer Lodge
Drummond
Garrison
Townsend
Boulder
Jefferson City
Radersburg
Ennis
Virginia City
Alder
Norris
Gardiner
Cooke City
Yellowstone National Park
Jackson
Victor
Driggs
Rexburg
Ashton
Sugar
Terreton
Dubois
Salmon
Challis
Stanley
Ketchum
Hailey
Bellevue
Gooding
Jerome
Twin Falls
Rupert
Burley
Malad City
Preston
Franklin
Soda Springs
Montpelier
Paris
Bear Lake
Lewiston
Clarkston
Pullman
Colfax
Palouse
Potlatch
Moscow
Genesee
Juliaetta
Kendrick
Orofino
Weippe
Pierce
Grangeville
Kamiah
Kooskia
Stites
Cottonwood
Nez Perce
Lapwai
Culdesac
Reubens
Craigmont
Winchester
Lewiston
Clarkston
Asotin
Anatomy
Pomeroy
Dayton
Starbuck
Waitsburg
Prescott
Walla Walla
Milton-Freewater
Weiser
Cambridge
Council
Midvale
Cascade
Yellow Pine
Stibnite
Salmon
Challis
Mackay
Arco
Howe
Leadore
Gilmore
Dubois
Spencer
Idmon
Rexburg
Ashton
Sugar
Terreton
Menan
Lewisville
Rigby
Ucon
Iona
Ammon
Swan Valley
Irwin
Alpine
Bone
Shelley
Firth
Basalt
Moreland
Blackfoot
Springfield
Pingree
Fort Hall
Sterling
Aberdeen
Tyhee
Chesterfield
Henry
Wayan
Afton
Bancroft
Lava Hot Springs
Lund
Soda Springs
Robin
Arimo
Marsh Valley
Virginia
Downey
Cleveland
Lago
Bennington
Montpelier
Dingle
Liberty
Paris
Bloomington
Fish Haven
Preston
Franklin
Weston
Dayton
Malad City
Gwenford
Samaria
Ridgedale
Woodruff
Oxford
Clifton
Holbrook
Stone
Nat
Almo
Oakley
Elba
Bridge
Malta
Marion
Albion
Churchill
Deglo
Heglar
Sublett
Roy
Rockland
Arbon
Hawkins
Crystal
Hot Springs
Lava

Population 588,637

Moose Creek Buttes...C 3
Nez Perce Pass.....D 4
North Pole (Mtn.).....D 3
Owyhee R.....G 2
Payette Lake.....E 2
Payette R.....F 2
Pend Oreille Lake.....A 2
Pend Oreille R.....A 2
Pilot Knob (Mtn.).....D 3
Pinyon Peak.....E 4
Pioneer Mts.....F 5
Priest Lake.....A 2
Raft R.....G 5
Red Peak.....E 3
Red Rock Pass.....E 7
Rhodes Peak.....C 4
Roughneck Peak.....E 3
Ryan Peak.....F 4
St. Joe R.....B 3
Salmon Falls R.....G 4
Salmon R.....D 3
Salmon River Mts.....D 3
Sawtooth Mts.....E 3
Selkirk Mts.....A 2
Selway R.....C 3
Seven Devils (Mts.)...D 2
Shoshone Falls.....G 4
Sleeping Deer Mtn...E 4
Smith Peak.....A 2
Smoky Mts.....F 4
Snake R.....E 1
Snake River Canyon...D 2
Snake River Plain....F 2
Snake River Range...F 7
Snowyside (Mtn.)....F 4
South Mtn.....G 2
Steel Mtn.....F 3
Swan Falls.....F 2
Targhee Pass.....E 7
Taylor Mtn.....E 4
Trinity Mtn.....F 3
Twin Peaks.....E 4
Weiser R.....E 2
Western Shoshone Ind. Res.....G 2
Whitecloud Peaks.....E 4
White Knob Mts.....F 5
Yellow Jacket Mts.....D 4

stones, such as jasper, agates, opals, sapphires, rubies, garnets, monazite sands, and amethysts, are found throughout the mountain regions of the state.

Idaho has a great source of wealth in its wildlife. Big-game hunting attracts many tourists. Deer is the most abundant large animal. Antelope are numerous, and there are elk, moose, bears, and mountain goats. Many species of game birds are hunted. These include the Chinese, or ring-necked, pheasant, the blue grouse, sage hen, and wild duck. Several varieties of trout, as well as bass, catfish, and perch, are caught in the rivers. The state is famous for Rocky Mountain whitefish, which are smoked and sold.

Conservation. The first Idaho game laws were adopted in 1893. Wild animal preserves were established in 1917, and many animals are protected by the state. The largest game preserve in Idaho is the Primitive Area. Here there are more than thirteen thousand deer, several hundred elk, and many bears, mountain goats and sheep, bobcats, and smaller animals.

Most of southern Idaho is arid and the land must be artificially watered, or irrigated, to produce farm crops. Projects for this purpose have been under development for many years. About 2,200,000 acres of land have been reclaimed from the desert. More than 5,100 dams have been constructed in the state, and also about 15,330 miles of canals and ditches.

By 1908, almost half of Idaho had been turned into national forest reserves. The state forester guards against fire on more than four million acres of state land and six million acres of privately owned land. The United States Forest Service guards the national woodlands. Nurseries at Boise and Smiths Ferry grow more than a million young trees a year. Hundreds of thousands of them have been transplanted to burned-over forest land.

The People and Their Work

Population: 588,637 (1950), ranking forty-third among the states. *Density*, 7.0 persons per square mile, ranking forty-third. *Distribution*, urban, 42.9 per cent; rural, 57.1 per cent. *Largest cities*, Boise (34,393), Pocatello (26,131), Idaho Falls (19,218), Twin Falls (17,600), Nampa (16,185), Lewiston (12,985), Coeur d'Alene (12,198). For population of other places, see back of colored map.

Chief Products: *Agricultural*, hay, wheat, barley, oats, corn, alfalfa, potatoes, sugar beets, fruits (especially apples, cherries, peaches, plums), vegetables (especially beans, peas, onions, lettuce, celery), cattle and dairy products, sheep and wool, hogs, horses, poultry and eggs, honey. *Mineral*, silver, lead, zinc, gold, copper, coal, limestone, sandstone, phosphate rock, fire clay, shale, antimony, tungsten, cobalt, cinnabar, gems (especially agates, jasper, opals, sapphires, rubies, garnets, amethysts). *Manufactured*, lumber products, beet sugar, canned goods, flour, meat products, phosphorus, and fertilizer.

The People. The Shoshones and Nez Percé were the chief Indian tribes in the Idaho country when the Lewis and Clark exploring expedition arrived in 1805. Fur traders, trappers, and missionaries followed Lewis and Clark. They had the country to themselves, except for a group of Mormons from Utah who founded a colony in the Lemhi Valley.

In 1860, gold was found in the Clearwater country. Soon afterward, rich deposits of gold were found in the Salmon River and Florence regions, the Boise Basin, and

ıch as jasper, agates, opals, sapphires, rubies, monazite sands, and amethysts, are found ut the mountain regions of the state.

has a great source of wealth in its wildlife. Bigıting attracts many tourists. Deer is the most t large animal. Antelope are numerous, and elk, moose, bears, and mountain goats. Many f game birds are hunted. These include the or ring-necked, pheasant, the blue grouse, sage wild duck. Several varieties of trout, as well as ish, and perch, are caught in the rivers. The amous for Rocky Mountain whitefish, which ed and sold.

vation. The first Idaho game laws were adopt-93. Wild animal preserves were established in d many animals are protected by the state. est game preserve in Idaho is the Primitive re there are more than thirteen thousand deer, undred elk, and many bears, mountain goats p, bobcats, and smaller animals.

f southern Idaho is arid and the land must be y watered, or irrigated, to produce farm crops. or this purpose have been under development years. About 2,200,000 acres of land have been l from the desert. More than 5,100 dams have structed in the state, and also about 15,330 anals and ditches.

3, almost half of Idaho had been turned into naest reserves. The state forester guards against ore than four million acres of state land and n acres of privately owned land. The United rest Service guards the national woodlands. at Boise and Smiths Ferry grow more than a oung trees a year. Hundreds of thousands of e been transplanted to burned-over forest land.

The People and Their Work

ion: 588,637 (1950), ranking forty-third among . *Density*, 7.0 persons per square mile, ranking d. *Distribution*, urban, 42.9 per cent; rural, cent. *Largest cities*, Boise (34,393), Pocatello Idaho Falls (19,218), Twin Falls (17,600), (16,185), Lewiston (12,985), Coeur d'Alene For population of other places, see back of ıap.

roducts: *Agricultural*, hay, wheat, barley, oats, alfa, potatoes, sugar beets, fruits (especially ıerries, peaches, plums), vegetables (especially as, onions, lettuce, celery), cattle and dairy sheep and wool, hogs, horses, poultry and ey. *Mineral*, silver, lead, zinc, gold, copper, coal, sandstone, phosphate rock, fire clay, shale, tungsten, cobalt, cinnabar, gems (especially sper, opals, sapphires, rubies, garnets, ame-*anufactured*, lumber products, beet sugar, canned ur, meat products, phosphorus, and fertilizer.

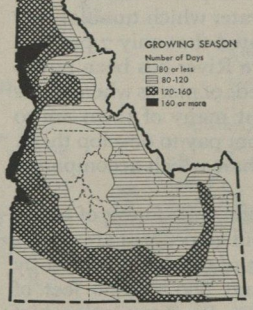
eople. The Shoshones and Nez Percé were the ian tribes in the Idaho country when the Lewis k exploring expedition arrived in 1805. Fur rappers, and missionaries followed Lewis and ıey had the country to themselves, except for f Mormons from Utah who founded a colony mhi Valley.

o, gold was found in the Clearwater country. rward, rich deposits of gold were found in the Iver and Florence regions, the Boise Basin, and the Coeur d'Alene region. Miners rushed in and set up towns. They worked out the gold or silver deposits, and moved on. Many of these early towns survive today only as "ghost towns," crumbling relics of once thriving communities. Perhaps the best known of them is Silver City. After the mining boom, came farmers and cattlemen from Utah and Wyoming. They were followed by sheep ranchers. More farmers came after irrigation projects had turned desert sections into highly productive farm land.

During the gold-rush days many Chinese came into the state. They have established small colonies in Boise and other principal cities. Persons of foreign descent include Scandinavians, Germans, English, and Canadians. There are about seven thousand Basques living in and around Boise. They are the descendants of sheep-raising highland ancestors who came from Spain to the west coast of the United States, and later pushed on to Idaho. There are about four thousand Indians living on reservations in Idaho. Most of the native American population came to the state from the East and the Middle West.

Agriculture. Many persons think of Idaho as chiefly a mining state, because of its rich deposits of silver and other minerals. Actually, agriculture is the principal occupation in the state. The early farmers of the state found many natural disadvantages, but these have been largely overcome in agricultural areas. The region most suitable to farming is in southern and central Idaho, on the level valley plains of the Snake River and its tributaries. Here the soil, made by the action of the weather on lava and volcanic ash, is very rich. Irrigation has transformed the desert into gardens and wheat fields. Dry farming, using crops which do not need much water, is carried on in parts of southern Idaho.

Hay and wheat are the most valuable farm products. Much wheat is grown, chiefly in the sections which are not irrigated. Potatoes are Idaho's most famous crop because of their high quality. In most years the cash value of the potato crop is second only to that of hay and wheat. Potatoes are grown especially in the irrigated Snake River region and along the southern border. Bingham, Bonneville, and Cassia counties lead in potato production. Peas and sugar beets are other important crops raised throughout Idaho. Eighty per cent of the peas grown in the United States come from a farming area around Lewiston. Apples, plums, prunes, peaches, and cherries are grown in the broad, sheltered valleys of Idaho.



There are large orchards located near Mesa, and canning plants are near by. Canyon County is a noted dairy area. Large quantities of milk, butter, and cheese are produced. Idaho is a leading state in the growing of field and garden seeds. Idaho alfalfa seed has been exported to foreign countries and has won many

n which mixed
Falls, and Ada
nan 3,600 such

farms devoted
beets, potatoes,
nyon and Twin
lettuce and cel-
d poultry, espe-
. These are sold
hough some are

began in Idaho
ed cattle were
eds of beef cat-
cres of land in
everal thousand
greater than the
of the leading
y which is car-
es. Idaho sends
state. It ranks
duction. Cattle
d the sheltered
mountains dur-
into the valleys
y, in the south-
ivestock county

ho ranks fourth
n land which is
ms. More than
d which covers
comes from a
irs, and dams.
nected with the
nt dams are the
American Falls
nderson Ranch
ss the Snake at
acres. Another
r, in south cen-

produce nearly
ts are operated
ch tumbles over
only 7 per cent
has been put to
ces where water
of them are so
develop them.
ch accompanies

forests of Idaho
cent are owned
orest is held by
000,000 feet of
ston is the chief
white-pine saw-
. This mill cuts
ear. Boxes and
Lewiston. Even
ef lumber prod-

ucts include veneer, laths, railroad ties, bridge and mine timbers, and telephone poles.

Minerals. Valuable minerals are found in thirty-six of the forty-four counties of Idaho, which is among the three leading states in the production of lead, and which leads all states in the mining of silver. The largest silver mine in the United States is located in the Coeur d'Alene district in Shoshone County. Metals worth over $1,500,000,000 have been mined in Idaho since 1860. The yearly value of metal mining is usually about $40,000,000. The most valuable minerals are copper, gold, zinc, and vanadium.

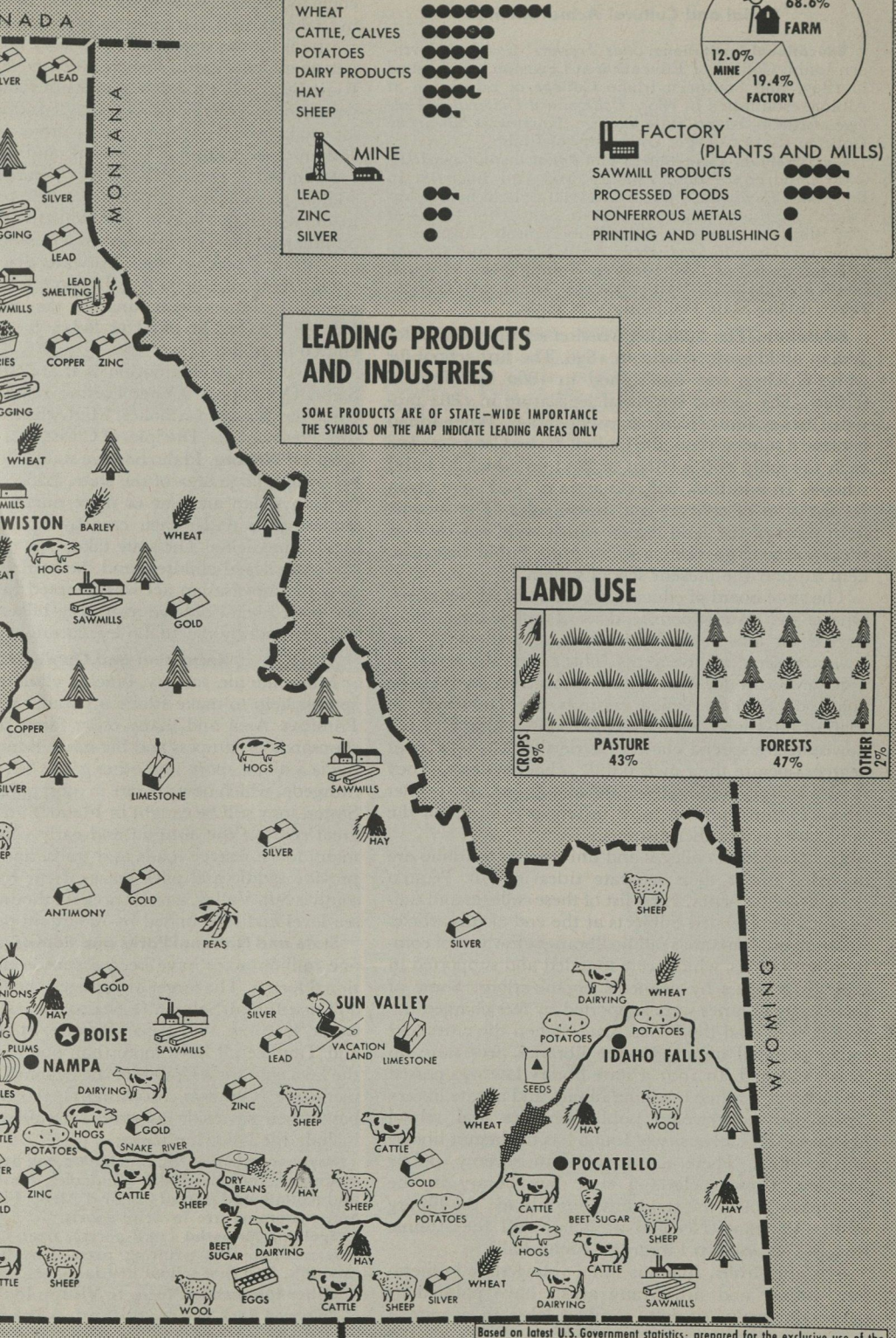
Manufacturing. Idaho has few large manufacturing industries. There are sugar-beet factories which refine about $4,000,000 worth of sugar each year. The manufacture of flour also is important. Cheese factories and milk-condensing plants process the milk produced by the dairy herds of the state. Some vegetables are canned. Lewiston has a large plant where fruit is frozen for market. Most of the livestock and the wool are shipped out of the state as raw materials to be processed elsewhere. A pulp and paper mill is located at Lewiston, and an elemental phosphorus plant at Pocatello, in the southeastern part of the state.

Transportation. Transportation has been a difficult problem in Idaho because of the great distances between cities, and because of the rugged, high mountains. The Indian trails were the first roads in the state. Pack trains of horses and mules were driven over these trails. Later came the stagecoaches, which carried express goods and passengers. Still larger loads of merchandise were carried by bull teams, which were oxen hitched to a train of wagons. Two of the earliest transcontinental roads in the United States went through Idaho. These roads were the Oregon Trail (see TRAILS OF EARLY DAYS) and the Mullan wagon road. The first railroad entered the state in 1874. This was the narrow-gauge Utah & Northern, built by a son of Brigham Young, the famous Mormon leader. The Oregon Short Line railroad was extended across the southern part of the state in the 1880's. The Northern Pacific, which was part of the railroad to the Coast, served northern Idaho. Railroad mileage more than doubled in the twenty years after 1907. There are now about 2,800 miles of railroad track in the state.

Paved roads were built in Idaho after the coming of automobiles and trucks. There are five main highways. The longest of these roads is U.S. 30. This highway crosses southern Idaho, generally along the route of the old Oregon Trail. Motorbus and truck transportation has developed rapidly. Two major air lines operate in Idaho. The state has more than sixty airports. The most important airfields are located at Lewiston, Boise, Pocatello, and Idaho Falls.

Press and Radio. The first newspaper in Idaho was the Lewiston *Golden Age*, established in August, 1862, by Alexander S. Gould. The present Lewiston *Tribune* is known throughout the West. The *Idaho Statesman* at Boise became a famous pioneer newspaper under the editorship of Calvin Cobb (see *Famous Idahoans* in this article). There are now fifteen daily newspapers and about ninety weeklies in Idaho. There are a number of radio stations in Idaho. The most important ones are

IDAHO



AVERAGE YEARLY VALUE OF LEADING PRODUCTS

EACH DISK REPRESENTS 10 MILLION DOLLARS

DISKS REPRESENTING FACTORY PRODUCTS INDICATE VALUE ADDED TO MATERIALS IN THE FACTORY

FARM

- WHEAT
- CATTLE, CALVES
- POTATOES
- DAIRY PRODUCTS
- HAY
- SHEEP

MINE

- LEAD
- ZINC
- SILVER

FACTORY (PLANTS AND MILLS)

- SAWMILL PRODUCTS
- PROCESSED FOODS
- NONFERROUS METALS
- PRINTING AND PUBLISHING

68.6% FARM
12.0% MINE
19.4% FACTORY

LEADING PRODUCTS AND INDUSTRIES

SOME PRODUCTS ARE OF STATE–WIDE IMPORTANCE
THE SYMBOLS ON THE MAP INDICATE LEADING AREAS ONLY

LAND USE

CROPS 8% | PASTURE 43% | FORESTS 47% | OTHER 2%

Based on latest U.S. Government statistics; prepared for the exclusive use of the WORLD BOOK ENCYCLOPEDIA by Pictograph Corporation

located at Boise, Idaho Falls, Lewiston, Nampa, Pocatello, and Twin Falls.

Social and Cultural Achievements

Educational Institutions: *State Teachers' Colleges*, Northern Idaho College of Education at Lewiston, established in 1893, and Southern Idaho College of Education at Albion, established in 1895. *Colleges and Universities*, College of Idaho, Idaho State College, Northwest Nazarene College, Ricks College, University of Idaho.

State Welfare, Correctional, and Penal Institutions: *Children*, Children's Home Finding and Aid Societies in Boise and Lewiston, State Industrial School at St. Anthony. *Physically handicapped*, State School for the Deaf and Blind at Gooding, State Tuberculosis Hospital at Gooding. *Mentally handicapped*, State School and Colony (feeble-minded and epileptic) at Nampa, State Hospital South at Blackfoot, State Hospital North at Orofino. *Prison*, Idaho State Penitentiary at Boise.

Education. The Spalding Mission set up a school for Indian children in Idaho in 1836. The first school for white children was established in 1860 by Mormon settlers. The second territorial legislature in 1864 provided for a system of elementary education. When Idaho became a state in 1890, the United States Congress gave each township two sections of land on which to build schools. In addition, 668,080 acres of land were given for the sites of colleges and universities. The income from parts of the land grants which were not used as sites for schools goes into a school fund. Public taxes also help support the present school system.

The state board of education consists of six members. One is the state superintendent of public instruction, elected for four years. The others, appointed by the governor, serve for five years. This board also serves as a State Board for Vocational Education, and as the Board of Regents which controls the University of Idaho and Idaho State College. Boise, Emmett, and Lewiston are special charter districts which, to a great degree, operate their own public school systems. They receive county and state financial support as do other school systems, and in most instances conform to the same laws as do other districts.

The accredited colleges and universities of Idaho are discussed under their separate titles in THE WORLD BOOK ENCYCLOPEDIA. For a list of these colleges and universities, see Related Subjects at the end of this article.

Libraries. The state's public libraries grew out of community libraries, which were founded and supported in their early years by women's organizations. Some of these early libraries were supported by fees charged the people who read the books. Later, when the cities and towns donated money for the libraries, fees were no longer charged. In 1901 a state library law was passed which created a free traveling library and a state library commission to develop public libraries and school libraries. The University of Idaho has the largest library in the state. There are more than seventy public libraries. These include a state law library in the Capitol at Boise, the state traveling library, the library at the Veterans' Hospital at Boise, and the Atomic Energy Commission Library at Idaho Falls.

Arts and Crafts. Idaho is still a young state in literature, music, and art. Many artists have painted its mountain peaks, sunsets, gemlike lakes in evergreen forests, and other scenic views. Perhaps it is this magnificence of nature which leads many native artists to become muralists. The sculptor Gutzon Borglum was born in Idaho. Writers, like painters, often choose their subject matter from the state itself, in history or legend. Idaho writers include Vardis Fisher, noted novelist, and Carol Ryrie Brink, Glenn Balch, and Ruth Plowhead Gipson, writers of juvenile books. Fort Hall Indians are famous for making soft, white leather from buckskin. The Indians also make fine beadwork and colorful baskets.

Religion. Missionaries brought organized religion to Idaho. Jason Lee conducted the first religious service in the region in 1834 at Fort Hall. In 1836, Henry H. Spalding and his wife established a mission at the mouth of Lapwai Creek on the Clearwater River. They also organized the first school and church. One of the oldest church buildings remaining in the state is Christ's Church (erected in 1866) at Boise, the first Episcopal church in Idaho.

The largest denomination is that of the Latter-Day Saints (Mormons). Other leading religious groups include the Roman Catholics, Methodists, Northern Baptists, Presbyterians, Disciples of Christ, and Episcopalians.

Social Welfare. Idaho has five state health units, each covering a large area of the state. Each division has its own physician and one or more nurses. They aid the communities under their care by education and preventive medicine. The state takes care of homeless and underprivileged children, and the mentally ill. A workman's compensation act was adopted in 1917. One of the most liberal old-age assistance bills in the country was adopted by the Idaho legislature in 1941.

Recreation and Outdoors

Mountain air, scenery, bracing climate, and mineral springs help to make Idaho a popular resort area. The Primitive Area and many other forest districts attract thousands of campers and big-game hunters. Trout fishing is a major sport, and other game fish are abundant. Sturgeon, which now are rare in most parts of the United States, may still be caught in Idaho. Bird hunting is the great sport of the autumn and early winter. There are many forest reserve roads and trails, and dude ranches provide saddle and pack horses. Near Ketchum in the south is Sun Valley, a resort area six thousand feet above sea level and surrounded by mountain peaks.

State and National Parks and Forests. About twenty-one million acres have been set aside in nineteen national forests. The larger of these are the Challis (2,468,067 acres) and Salmon (2,074,051 acres). Boise, Clearwater, Kaniksu, Nez Percé, Payette, St. Joe, Sawtooth, and Targhee all have more than one million acres. In the lava country is Craters of the Moon National Monument (see NATIONAL MONUMENT). About 42,500 acres have been set aside as state recreation areas. These include the following parks:

Heyburn (7,838 acres, of which 2,333 are water), near Plummer. Includes Lakes Chatcolet, Hidden, Benewah, and Round, and part of Coeur d'Alene. Fishing, boating, and swimming are favorite sports.

Spalding Memorial (13.8 acres), near Lapwai. Site of first mission, first printing press, first flour mills and sawmills, and first school in Idaho.

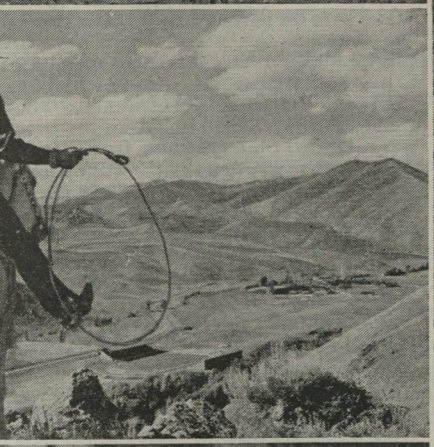
Other Interesting Places to Visit in Idaho include:

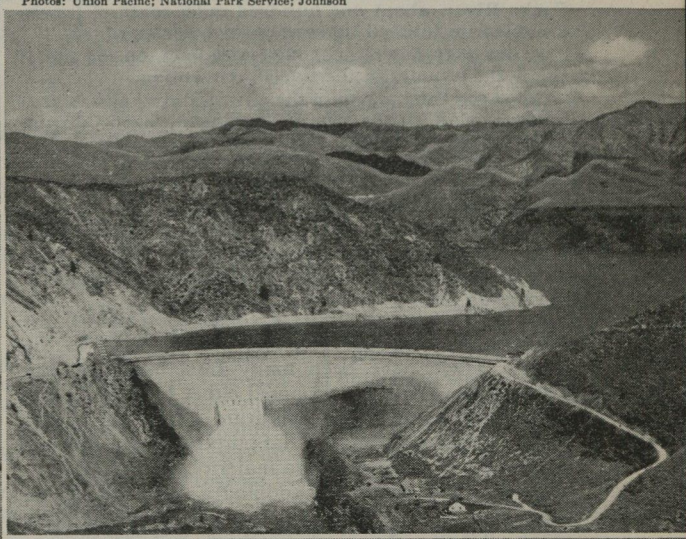
Balanced Rock, near Castleford. A heavy, 40-foot-high

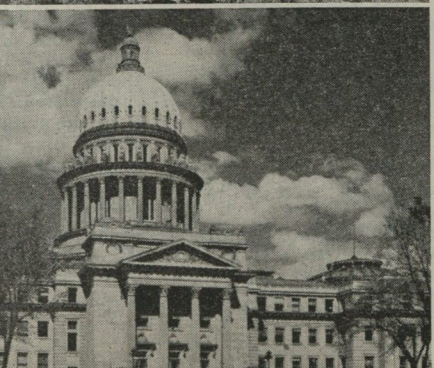
MOUNTAINS, WATERFALLS, AND RIVERS

Above: A scenic section of the Sawtooth Mountains, with pine-covered hills in the middle foreground. *Left:* Picturesque Colonnade Falls on the Bechler River. *Third left:* Looking down on the popular vacation center of Sun Valley; the rodeo arena is shown in the foreground. *Below:* Arrowrock Dam, more than one fifth of a mile in length, backs up the water of the Boise River. *Bottom left:* The state Capitol at Boise. *Bottom right:* Cattle watering on the sandy banks of the Salmon River.

Photos: Union Pacific; National Park Service; Johnson







rock which is balanced on a small block of stone.

Caves. There are thousands of underground caverns. The following are of special interest: *Crystal Falls*, near Saint Anthony. An ice cave with a frozen river and beautiful formations of ice and stone. *Minnetonka*, in the St. Charles Canyon near Paris. Enormous rugged chambers like Gothic halls lie in a mountain ridge at an elevation of 7,500 feet. *Shoshone Ice Cave*, near Shoshone. A huge two-room cavern under lava fields. Walls and ceiling are lined with ice.

Cities of Rocks, erosion formations carved in the southern Albion Range. Granite rocks rise in strange shapes out of a deep basin. One such area, called *Cassia*, includes nine square miles of rock groups which look like small villages. No two groups of rocks are alike. There are towers, spires, and rocks which look like small skyscrapers. Some rocks look like Oriental temples, or churches. Others look like birds and animals. One rock formation on a granite ledge is called the *Old Woman*. The *Gooding* area, about four miles long, has huge, brilliantly colored round stones at its eastern entrance. Reds and browns are the chief colors.

Ghost Towns, reminders of the old mining days. These towns once bustled with activity but were abandoned when veins of gold ore were worked out. Among the many such towns are *De Lamar* in Owyhee County, and *Eagle City* in Shoshone County.

Hell's Canyon, one of the deepest canyons in the United States. The depth is almost 6,000 feet. Located on the Snake River, about one hundred miles south of Lewiston. Can be reached by boat or on horseback.

Packer John Cabin, near New Meadows, on the site of the first Democratic territorial convention.

Shoshone Falls, north of the city of Twin Falls. A 212-foot waterfall on the rim of the Snake River Canyon. The falls are sometimes lighted at night.

Government

National: Electoral votes, 4. Representatives in Congress, 2.

State: Senators, 44; representatives, 59. *Capital*, Lewiston (territorial) from 1863 to 1865; Boise since 1865.

Counties: 44.

Idaho is governed under a constitution which was adopted in 1889, just before it was admitted to the Union. There have been many amendments to the constitution. These are proposed either by a two-thirds vote of both houses of the legislature or by a convention called by the legislature for that purpose. A new amendment must be approved by a majority of the voters.

In 1919 the legislature adopted a consolidated, or cabinet, form of government. The governor is the head of the cabinet, and seven department commissioners are the other members. An executive budget system for the state also was adopted in 1919. Primary elections are required for the selection of candidates for state offices.

Executive officers include the governor, lieutenant governor, secretary of state, auditor, treasurer, attorney general, superintendent of public instruction, and inspector of mines. Each of these officers is elected for a four-year term.

Legislative power is exercised by a senate and a house of representatives. The senate is made up of one member from each county. The number of representatives is determined by the number of voters. But the house must also include one member from each county. Members of both the senate and the house of representatives are elected for two-year terms. The legislature meets on the first Monday after January 1 in odd-numbered years. Regular sessions are sixty days in length. Speci sions must not exceed twenty days.

Judicial decisions rest with a system of courts h by the state supreme court. This court has five ju one of whom is elected each year. Each justice s six-year term. There are eleven district courts, probate court in each county.

Local Government. Each county is governed b commissioners. Villages are governed by a bo trustees. Cities have a mayor and a council.

National Politics. For a long time, Idaho too part in national politics, except for the votes of zens. This was because the state was so far from tional capital, and transportation was poor. Fro until his death in 1940, United States Senator W E. Borah of Idaho was an important figure in n politics. Idaho voted the Republican ticket at fi tions out of eight, beginning in 1900. But after 19 state usually voted Democratic. See POLITICAL (Chart).

Famous Idahoans

Among the noted men and women of Idaho ar who have separate biographies (see list of *Biogra* the end of this article). Others who have achieve national, or international fame include:

Cobb, Calvin (1853-1928), born in Cleveland, Editor and publisher of the daily newspaper, th *Statesman*, at Boise, from 1889 until shortly bef death. He strongly influenced the development state, and was a power in Republican politics.

Gooding, Frank R. (1867-1928), born in En Governor of Idaho from 1905 to 1907 and United Senator from 1921 to 1928. He entered the States with his parents in 1867, and came to Idaho age of twenty-one years. There he was first a contractor, and later a farmer and stock raiser.

Heyburn, Weldon B. (1852-1912), born in De County, Pennsylvania. He went to Shoshone C Idaho, in 1883, where he began the practice of la was a United States Senator from 1903 until his and one of the authors of the Pure Food Law.

Spalding, Henry Harmon (1804-1874), born nea N.Y., came to Idaho as a missionary in 183 founded a mission for the Nez Percé Indians at L near Lewiston.

State Symbols and Events

State Seal. The figure of the woman stands for The man represents mining. The forest-bordered River is pictured on the shield between them. Th

of wheat and two flowing horns of pl the bottom of the shi symbols of Idaho fa Above the shield r elk's head, which sta the wildlife of the

State Flag. The st is in the middle of of dark blue. Below is a red band bearing the words, "State of Idaho flag is bordered with a golden fringe. It was ado 1907. See FLAG (color plate, Flags of the States).

State Motto. *Esto Perpetua* (It is perpetuated).

State Bird. Mountain bluebird. See BIRD (colo State Birds).

State Flower. Syringa.

State Tree. White pine.

Union Pacific Railroad

Challenger Inn at Sun Valley in the mountains of Idaho is one of the state's most picturesque resorts. In summer, guests ride horses or tramp over the near-by mountain trails. Winter sunshine and snow attract skaters and skiers.

State Song. "Here We Have Idaho." Words by McKinley Helm; music by Sallie Hume-Douglas.

Annual State Events of interest to visitors include:

Dog Team Derby, Ashton, February 22.
Winter Sports Carnival, McCall, last day of February, and March 1.
Music Week, Boise, May (no fixed date).
Cherry Blossom Festival, Lewiston, May (no fixed date).
Cherry Festival, Emmett, June (no fixed date).
Water Regatta, Coeur d'Alene, July 3 to 5.
Stampede and Rodeo, Soda Springs, August (no fixed date).
Spud Day, Shelley, at end of potato harvest in October.

History

1805 Lewis and Clark Expedition passed through Idaho.
1809 First fur trading post in Idaho region built by David Thompson.
1834 Fort Boise established; Fort Hall built.
1837 First white child born in Idaho—Eliza Spalding, daughter of famous early missionaries.
1855 Mormons built first irrigation canals in the region.
1860 Gold discovered on Orofino Creek. First permanent settlement, Franklin, established.
1861 Lewiston, first incorporated town, founded.
1863 Idaho Territory organized; silver ore discovered.
1874 First railroad in Idaho, the narrow-gauge Utah & Northern, crossed the state line near Franklin.
1877 Nez Percé Indian War, June to October.
1884 Lead and silver discovered in Coeur d'Alene region.
1890 Idaho admitted to Union as forty-third state.
1896 Amendment of constitution permitted women to vote.
1908 Almost half of Idaho became national forest reserves.
1912 Land reclamation begun under Carey Act.
1933 Equalization Act reorganized state support of schools.
1941 Mines and farms expanded production for war.
1945 Idaho industries turned to peacetime production.
1950 An amendment to give the state's Indian residents full citizenship was approved.

Exploration and Settlement. In 1805 Lewis and Clark became the first to explore what is now Idaho (see LEWIS AND CLARK EXPEDITION). The missionary Spaldings were the first white family to settle in the state (1836). They built the first gristmill and sawmill, and the first school and church at Lapwai. They also set up the first printing press west of the Rockies and north of California. This press was a gift of the Protestant native church of the Sandwich Islands (now Hawaii).

A party of Mormons, who believed they were still in Utah, settled in eastern Idaho in 1855. The Mormons built Fort Lemhi, and began the first irrigation of the land. In 1860, they founded the town of Franklin. In the same year, Captain E. D. Pierce found gold in the Orofino region. News of this gold strike spread rapidly. Goldseekers poured into the territory. Although many people moved on after the most easily reached deposits of gold were worked out, many remained as settlers.

Territorial Progress. The Territory of Idaho was organized on March 3, 1863. It included what is now Montana and nearly all Wyoming. In 1864 Montana was separated from the territory. Wyoming became a separate territory in 1868.

The Nez Percé War of 1877 began when an attempt was made to force the Nez Percé Indians to move to the Lapwai Reservation. Led by Chief Joseph, a small band of Indians defeated United States troops at White Bird Canyon. Later, the Nez Percé escaped from an encounter on the Clearwater. The Nez Percé were forced to surrender three months later when they were surrounded in Montana near the Canadian border. A year later there was an uprising of the Bannacks. But by 1894 most of the Indians had settled on reservations.

By 1883, so many Mormons had settled in the southern part of the state that the legislature passed a law taking away their right to vote. In 1893 the Mormon church gave up polygamy as a part of its religion. After

that, any Mormon having only one wife was allowed to vote.

Progress as a State. In 1889 the territory adopted a new constitution. On July 3, 1890, Idaho was admitted to the Union as the forty-third state.

As the mining industry grew, there were many quarrels between the miners and the mineowners. In 1892 a strike at the Coeur d'Alene mine lasted six months. There were riots and battles between union and nonunion men in the lead-and silver-mining area. State and Federal troops had to be called to restore order. New strikes broke out in 1894 and 1899. The last time, Federal soldiers had to be sent into the state again. Bitter feeling continued long afterward. In 1905, Governor Frank Steunenberg was murdered. Several mine union leaders were accused of the murder. The trial, held in 1907, attracted international notice. It brought to fame the young lawyer, William E. Borah, who represented the state. Clarence Darrow represented the defendants, one of whom, Harry Orchard, was convicted. But other accused officers of the miners' federation, headed by "Big Bill" Haywood, were set free.

In 1896 an amendment to the constitution granted women the right to vote. In 1921 a proposal was made to create a new state, to be called Lincoln. It was to be formed from parts of Idaho, Washington, and Montana. This proposal failed, however.

Mining, lumbering, and agriculture continued to develop through the years. Idaho played an important part in World War II as a source of raw materials for war production. H.L.TA.

Related Subjects. The reader is also referred to:

BIOGRAPHIES

Borah, William Edgar
Borglum, Gutzon
Brink, Carol Ryrie
Darrow, Clarence
Fisher, Vardis
Lee, Jason
Pound, Ezra Loomis
Sacagawea
Shoup, George Laird

CHIEF PRODUCTS

Alfalfa
Barley
Lead
Pea
Plum
Potato
Sheep
Silver
Wheat
Wool

CITIES

Boise
Coeur d'Alene
Kellogg
Lewiston
Pocatello
Salmon
Twin Falls

COLLEGES AND UNIVERSITIES

Idaho, College of
Idaho, University of
Idaho College of Education
Idaho State College
Northwest Nazarene College

PHYSICAL FEATURES

American Falls Dam
Anderson Ranch Dam
Arrowrock Dam
Bitterroot Range
Snake River
Wasatch Range

UNCLASSIFIED

Food (Famous Foods of the United States)
Indian, American
Lewis and Clark Expedition
Nez Percé

Books for Young Readers

BALCH, GLENN. *Winter Horse*. Crowell, 1951. Tack Ranch stories of the range country in Idaho. *Lost Horse*. 1950. *Christmas Horse*. 1949. *Wild Horse*. 1947.

BAUMANN, JOHN. *Idaho Sprout; the Story of a Western Boyhood*. Morrow, 1950. A sequel to *Old Man Crow's Boy*. 1948. The story of an early settler's son.

BRACKEN, CLAIRE BOYLE. *Child's Idaho*. Syms-York Co., Boise, Idaho, 1942. History and development.

PLOWHEAD, RUTH (GIPSON). *Lucretia Ann on the Sagebrush Plains*. Caxton, 1936. A little girl found happiness romping on the sagebrush hills in Idaho.

Books for Older Readers

BAILEY, ROBERT G. *River of No Return*. R. G. Bailey Printing Co., Lewiston, Idaho, 1948. Early history, especially of mining and frontier life, Indian wars, customs, and legends. Salmon River country.

BROSNAN, CORNELIUS JAMES. *History of the State of Idaho*. rev. ed. Scribner, 1948.

BRUNEAU, LYDA HOFFMAN. *Stories of Idaho;* with illustrations depicting life in Idaho from pioneer days to the present. R. G. Bailey Printing Co., Lewiston, 1940.

DAVIS, NELLE PORTREY. *Stump Ranch Pioneer*. Dodd, 1942. Starting life anew in northern Idaho.

DONALDSON, THOMAS CORWIN. *Idaho of Yesterday*. Caxton, 1941. Early Idaho and its pioneers.

GREENWOOD, ANNIE (PIKE). *We Sagebrush Folks*. Appleton-Century, 1934. Pioneer life in the Minidoka district.

HAINES, FRANCIS. *Story of Idaho*. Syms-York Co., Boise, 1942. Idaho from the glacial period to modern times.

Red Eagles of the Northwest; the Story of Chief Joseph and His People. Scholastic Press, Portland, Ore., 1939.

Idaho, a Guide in Word and Picture. 2nd. ed. rev. Oxford, 1950. (American Guide series.) A description of the state as it is today, with suggested tours.

An Outline suitable for Idaho will be found with the article "State."

Questions

Why is Idaho called the Gem of the Mountains?

What Idaho waterfall is higher than Niagara Falls?

What gorge is deeper than the Grand Canyon?

Why is it possible in some places for sheep and cattle to graze outdoors all winter in Idaho?

What is meant by each of the following: ghost towns, Primitive Area, mountain-walled solitude?

What famous pioneer trail is now one of the principal highways of the West?

IDAHO, COLLEGE OF, is a coeducational liberal arts school at Caldwell, Idaho. It is controlled by the Presbyterian Church. The college has courses leading to B.A. and B.S. degrees. It was founded in 1891, and has an enrollment of about 400.

IDAHO, UNIVERSITY OF, is a coeducational land-grant school at Moscow, Idaho. It has colleges of letters and science, agriculture, engineering, and law, the schools of mines, forestry, education, and business, and a graduate school. The university was founded in 1889 and has an enrollment of about 3,000. H.E.L.

IDAHO COLLEGE OF EDUCATION is the name of two state-supported, coeducational teacher training schools in Idaho.

Northern Idaho College of Education is at Lewiston. The school was organized in 1893 and has an enrollment of about 400.

Southern Idaho College of Education is at Albion. Resident students live in dormitories. The school was established in 1895. The enrollment is about 350.

IDAHO STATE COLLEGE is a coeducational arts and science school at Pocatello, Idaho. It was founded in 1901, and from 1927 to 1947 was the southern branch of the University of Idaho. Enrollment, about 1,480.

IDEALISM. An ideal is a standard by which we judge the things in our experience. We picture in imagination the qualities or characteristics we should like to find in a person, an object, or an act. Then we try to make or find something that comes as close to the ideal as we can manage.

Some of our common words refer to ideals rather than to anything real. For example, a circle is a curved line which at all points is exactly the same distance from a point within called the center. Actually there is no such thing as a perfect circle. But with the aid of a compass we can draw a line which comes very close to meeting the ideal specifications for a circle.

In Everyday Life, most persons set standards, or ideals, for their own conduct and, perhaps, for the conduct of other persons. In common speech, this attitude is often called *idealism*. Such idealism may be concerned with religion, morals, etiquette, business, government, or any kind of human activity.

Carl Schurz, the German-American statesman, defined ideals this way:

> "Ideals are like stars; you will not succeed in touching them with your hands. But like the seafaring man on the desert of waters; you choose them as your guides, and following them you will reach your destiny."

This idea that ideals are as remote as stars has caused some persons to confuse idealism with impracticality. They have referred to idealists as being "starry-eyed." But actually ideals are very practical. Most of the good things which men have accomplished have come about as the result of following ideals.

One outstanding example of the way ideals have changed the world is our present democratic government in the United States. The Founding Fathers set forth many of their ideals in the Declaration of Independence. They fought long and hard to win these ideals in the Revolutionary War. Finally, they set up the Constitution and the Bill of Rights to preserve their ideals. Today we take for granted a system of government which once was regarded as a "starry-eyed" ideal.

Men who have become great statesmen, businessmen, artists, lawyers, and religious leaders have done so because they set ideals for themselves, then followed them. Sometimes these ideals have sounded impossible or fantastic when they were first proposed, but by sticking to their ideals and achieving their goals these men won success and benefited mankind.

Young people are usually aware of some conflict between their actual conduct and their ideals. Often the conduct needs to be improved, but sometimes the ideal needs to be re-examined. It is possible to be too much of a perfectionist. Housewives can be too fussy; students may insist on neat papers at too great a cost of time. One needs to weigh ideals — the demands of common sense, health, and friendship are more important than over-conscientious attention to details.

In Philosophy, the name *idealism* is given to any theory which sees the universe as the embodiment of mind or reason. Some idealisms, such as Platonism, recognize both mind and matter in the universe, and merely assert that mind is far more important. Other idealisms, such as the idealism of Heg[illegible] consciousness or reason is the basis of *all* [illegible]

Some idealists argue that only [illegible] known, since everyone must deal with each [illegible] perceives it, and can never get in touch [illegible] ject in itself," if such a thing exists. This vi[illegible] idealists to assert that there is a real mat[illegible] whose *existence* can be taken for granted, [illegible] we can never know anything about it. Oth[illegible] we cannot even be sure the material univer[illegible] some have confidence that it does not.

Bishop Berkeley took the position that [illegible] real except ideas and impressions, and [illegible] apparent reality of objects by the theory [illegible] ideas in the mind of God. Edmund Gosse [illegible] Berkeley had "pulled the universe into [illegible] then pulled his head in after it."

The philosophy of idealism includes m[illegible] points of view. Practically all religions hav[illegible] philosophy of some type.

See also METAPHYSICS; PHILOSOPHY; [illegible] TALIST.

IDEOGRAM, or **IDEOGRAPH,** is pictur[illegible] earliest form of writing. A man who wish[illegible] idea of a bird, for example, drew a pic[illegible] early Egyptians are believed to be the [illegible] use this form of writing. Hieroglyphic wri[illegible] the alphabet, developed from ideograms. [illegible] NESE LANGUAGE; HIEROGLYPHIC; PICTOGR[illegible]

IDES. In the old Roman calendar the [illegible] near the middle of each month. It was [illegible] of all months except March, May, July, [illegible] when the ides fell on the fifteenth. The ide[illegible] which Caesar was assassinated, was Ma[illegible] persons in the United States speak of the [illegible] with some uneasiness because it is the [illegible] income-tax payments are due. See also M[illegible]

IDIOM, *IHD ih um.* When we say "Tha[illegible] saying," we are speaking *idiomatic* langua[illegible] that something is taken for granted. B[illegible] means really nothing, and has no conne[illegible] out saying." An idiom thus is an expressio[illegible] stood meaning is different from the lite[illegible] meaning of its words. Often the terms of [illegible] not be explained by rules of grammar. T[illegible] usually is not found in two different la[illegible] idioms make up the most vivid expressi[illegible] guage. Persons learning a foreign langua[illegible] late literally what are really idiomatic fo[illegible] of greeting is, "How do you do?" The Ge[illegible] "How does it go with you?" The French i[illegible] do you carry yourself?" Our idiom at parting [illegible] which originally meant, *God be with you*, [illegible] say, "Until the sight." Other examples of [illegible] *come by* (obtain), *to bring about* (accomplish[illegible] *out* (achieve).

IDIOT. An idiot is a person whose inelli[illegible] that he has no power of self-control or a[illegible] mental ability is less than that of a two-[illegible] He cannot feed himself or care for himse[illegible] He may have been born an idiot, or he [illegible] an accident which caused the condition. [illegible] to blame if he commits a crime, and sh[illegible]

that, any Mormon having only one wife was allowed to vote.

Progress as a State. In 1889 the territory adopted a new constitution. On July 3, 1890, Idaho was admitted to the Union as the forty-third state.

As the mining industry grew, there were many quarrels between the miners and the mineowners. In 1892 a strike at the Coeur d'Alene mine lasted six months. There were riots and battles between union and nonunion men in the lead-and silver-mining area. State and Federal troops had to be called to restore order. New strikes broke out in 1894 and 1899. The last time, Federal soldiers had to be sent into the state again. Bitter feeling continued long afterward. In 1905, Governor Frank Steunenberg was murdered. Several mine union leaders were accused of the murder. The trial, held in 1907, attracted international notice. It brought to fame the young lawyer, William E. Borah, who represented the state. Clarence Darrow represented the defendants, one of whom, Harry Orchard, was convicted. But other accused officers of the miners' federation, headed by "Big Bill" Haywood, were set free.

In 1896 an amendment to the constitution granted women the right to vote. In 1921 a proposal was made to create a new state, to be called Lincoln. It was to be formed from parts of Idaho, Washington, and Montana. This proposal failed, however.

Mining, lumbering, and agriculture continued to develop through the years. Idaho played an important part in World War II as a source of raw materials for war production. H.L.TA.

Related Subjects. The reader is also referred to:

BIOGRAPHIES

Borah, William Edgar
Borglum, Gutzon
Brink, Carol Ryrie
Darrow, Clarence
Fisher, Vardis
Lee, Jason
Pound, Ezra Loomis
Sacagawea
Shoup, George Laird

CHIEF PRODUCTS

Alfalfa
Barley
Lead
Pea
Plum
Potato
Sheep
Silver
Wheat
Wool

CITIES

Boise
Coeur d'Alene
Kellogg
Lewiston
Pocatello
Salmon
Twin Falls

COLLEGES AND UNIVERSITIES

Idaho, College of
Idaho, University of
Idaho College of Education
Idaho State College
Northwest Nazarene College

PHYSICAL FEATURES

American Falls Dam
Anderson Ranch Dam
Arrowrock Dam
Bitterroot Range
Snake River
Wasatch Range

UNCLASSIFIED

Food (Famous Foods of the United States)
Indian, American
Lewis and Clark Expedition
Nez Percé

Books for Young Readers

BALCH, GLENN. *Winter Horse*. Crowell, 1951. Tack Ranch stories of the range country in Idaho. *Lost Horse*. 1950. *Christmas Horse*. 1949. *Wild Horse*. 1947.

BAUMANN, JOHN. *Idaho Sprout; the Story of a Western Boyhood*. Morrow, 1950. A sequel to *Old Man Crow's Boy*. 1948. The story of an early settler's son.

BRACKEN, CLAIRE BOYLE. *Child's Idaho*. Syms-York Co., Boise, Idaho, 1942. History and development.

PLOWHEAD, RUTH (GIPSON). *Lucretia Ann on the Sagebrush Plains*. Caxton, 1936. A little girl found happiness romping on the sagebrush hills in Idaho.

Books for Older Readers

BAILEY, ROBERT G. *River of No Return*. R. G. Bailey Printing Co., Lewiston, Idaho, 1948. Early history, especially of mining and frontier life, Indian wars, customs, and legends. Salmon River country.

BROSNAN, CORNELIUS JAMES. *History of the State of Idaho*. rev. ed. Scribner, 1948.

BRUNEAU, LYDA HOFFMAN. *Stories of Idaho;* with illustrations depicting life in Idaho from pioneer days to the present. R. G. Bailey Printing Co., Lewiston, 1940.

DAVIS, NELLE PORTREY. *Stump Ranch Pioneer*. Dodd, 1942. Starting life anew in northern Idaho.

DONALDSON, THOMAS CORWIN. *Idaho of Yesterday*. Caxton, 1941. Early Idaho and its pioneers.

GREENWOOD, ANNIE (PIKE). *We Sagebrush Folks*. Appleton-Century, 1934. Pioneer life in the Minidoka district.

HAINES, FRANCIS. *Story of Idaho*. Syms-York Co., Boise, 1942. Idaho from the glacial period to modern times.

Red Eagles of the Northwest; the Story of Chief Joseph and His People. Scholastic Press, Portland, Ore., 1939.

Idaho, a Guide in Word and Picture. 2nd. ed. rev. Oxford, 1950. (American Guide series.) A description of the state as it is today, with suggested tours.

An Outline suitable for Idaho will be found with the article "State."

Questions

Why is Idaho called the Gem of the Mountains?
What Idaho waterfall is higher than Niagara Falls?
What gorge is deeper than the Grand Canyon?
Why is it possible in some places for sheep and cattle to graze outdoors all winter in Idaho?
What is meant by each of the following: ghost towns, Primitive Area, mountain-walled solitude?
What famous pioneer trail is now one of the principal highways of the West?

IDAHO, COLLEGE OF, is a coeducational liberal arts school at Caldwell, Idaho. It is controlled by the Presbyterian Church. The college has courses leading to B.A. and B.S. degrees. It was founded in 1891, and has an enrollment of about 400.

IDAHO, UNIVERSITY OF, is a coeducational land-grant school at Moscow, Idaho. It has colleges of letters and science, agriculture, engineering, and law, the schools of mines, forestry, education, and business, and a graduate school. The university was founded in 1889 and has an enrollment of about 3,000. H.E.L.

IDAHO COLLEGE OF EDUCATION is the name of two state-supported, coeducational teacher training schools in Idaho.

Northern Idaho College of Education is at Lewiston. The school was organized in 1893 and has an enrollment of about 400.

Southern Idaho College of Education is at Albion. Resident students live in dormitories. The school was established in 1895. The enrollment is about 350.

IDAHO STATE COLLEGE is a coeducational arts and science school at Pocatello, Idaho. It was founded in 1901, and from 1927 to 1947 was the southern branch of the University of Idaho. Enrollment, about 1,480.

IDEALISM. An ideal is a standard by which we judge the things in our experience. We picture in imagination the qualities or characteristics we should like to find in a person, an object, or an act. Then we try to make or find something that comes as close to the ideal as we can manage.

Some of our common words refer to ideals rather than to anything real. For example, a circle is a curved line which at all points is exactly the same distance from a point within called the center. Actually there is no such thing as a perfect circle. But with the aid of a compass we can draw a line which comes very close to meeting the ideal specifications for a circle.

In Everyday Life, most persons set standards, or ideals, for their own conduct and, perhaps, for the conduct of other persons. In common speech, this attitude is often called *idealism*. Such idealism may be concerned with religion, morals, etiquette, business, government, or any kind of human activity.

Carl Schurz, the German-American statesman, defined ideals this way:

> "Ideals are like stars; you will not succeed in touching them with your hands. But like the seafaring man on the desert of waters; you choose them as your guides, and following them you will reach your destiny."

This idea that ideals are as remote as stars has caused some persons to confuse idealism with impracticality. They have referred to idealists as being "starry-eyed." But actually ideals are very practical. Most of the good things which men have accomplished have come about as the result of following ideals.

One outstanding example of the way ideals have changed the world is our present democratic government in the United States. The Founding Fathers set forth many of their ideals in the Declaration of Independence. They fought long and hard to win these ideals in the Revolutionary War. Finally, they set up the Constitution and the Bill of Rights to preserve their ideals. Today we take for granted a system of government which once was regarded as a "starry-eyed" ideal.

Men who have become great statesmen, businessmen, artists, lawyers, and religious leaders have done so because they set ideals for themselves, then followed them. Sometimes these ideals have sounded impossible or fantastic when they were first proposed, but by sticking to their ideals and achieving their goals these men won success and benefited mankind.

Young people are usually aware of some conflict between their actual conduct and their ideals. Often the conduct needs to be improved, but sometimes the ideal needs to be re-examined. It is possible to be too much of a perfectionist. Housewives can be too fussy; students may insist on neat papers at too great a cost of time. One needs to weigh ideals — the demands of common sense, health, and friendship are more important than overconscientious attention to details.

In Philosophy, the name *idealism* is given to any theory which sees the universe as the embodiment of mind or reason. Some idealisms, such as Platonism, recognize both mind and matter in the universe, and merely assert that mind is far more important. Other idealisms, such as the idealism of Hegel, consciousness or reason is the basis of *all* re

Some idealists argue that only mental known, since everyone must deal with each perceives it, and can never get in touch w ject in itself," if such a thing exists. This view idealists to assert that there is a real mater whose *existence* can be taken for granted, e we can never know anything about it. Other we cannot even be sure the material universe some have confidence that it does not.

Bishop Berkeley took the position that r real except ideas and impressions, and ex apparent reality of objects by the theory th ideas in the mind of God. Edmund Gosse re Berkeley had "pulled the universe into hi then pulled his head in after it."

The philosophy of idealism includes ma points of view. Practically all religions have philosophy of some type.

See also METAPHYSICS; PHILOSOPHY; TR TALIST.

IDEOGRAM, or **IDEOGRAPH,** is picture earliest form of writing. A man who wished idea of a bird, for example, drew a pictur early Egyptians are believed to be the fir use this form of writing. Hieroglyphic writi the alphabet, developed from ideograms. S NESE LANGUAGE; HIEROGLYPHIC; PICTOGRA

IDES. In the old Roman calendar the *id* near the middle of each month. It was th of all months except March, May, July, a when the ides fell on the fifteenth. The ides which Caesar was assassinated, was Marc persons in the United States speak of the id with some uneasiness because it is the da income-tax payments are due. See also Mo

IDIOM, *IHD ih um.* When we say "That saying," we are speaking *idiomatic* languag that something is taken for granted. But means really nothing, and has no connectio out saying." An idiom thus is an expression stood meaning is different from the litera meaning of its words. Often the terms of a not be explained by rules of grammar. The usually is not found in two different lan idioms make up the most vivid expressio guage. Persons learning a foreign language late literally what are really idiomatic form of greeting is, "How do you do?" The Germ "How does it go with you?" The French id do you carry yourself?" Our idiom at parting which originally meant, *God be with you.* say, "Until the sight." Other examples of *come by* (obtain), *to bring about* (accomplish) *out* (achieve).

IDIOT. An idiot is a person whose intellig that he has no power of self-control or at mental ability is less than that of a two-yr He cannot feed himself or care for himself He may have been born an idiot, or he m an accident which caused the condition. A to blame if he commits a crime, and the

allow him to sign contracts. But he can inherit property, which must be held for him by a trustee. See also HANDICAPPED, THE (Education of the Feeble-Minded). G.W.BE.

IDOL is an image made to represent the idea of a god or supernatural being. Idols often appear in primitive society that has developed some degree of civilization. The early peoples of Mexico and Central America had idols. They were also common among early historical civilizations such as those of Greece, Rome, Egypt, and India.

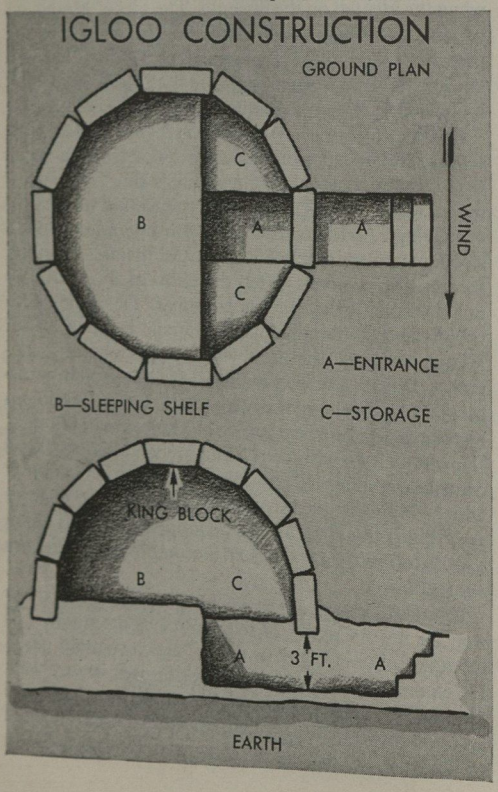
The Old Testament forbids the making of an image of God in wood or stone. The Koran forbids the Moslems from making any kind of picture or image of their god, whom they call Allah. But idols are very numerous in Hindu and Buddhist lands, such as China, Japan, and southeast Asia. They are also common on the Island of Bali.

Idols were used in early Christianity, but many people objected even then. They disappeared almost completely in Eastern Christianity. In Western Christianity idols are usually called images. The word *idol* soon came to be connected with heathen worship, rather than Christian. *Idolatry* meant the worship of idols.

Probably no people worship the idols which are sometimes called *fetishes*. They consider them to be merely images which remind them of their gods. In most cases, prayers and offerings are made through idols rather than to them. W.D.W.

See also FETISH; ICON; ICONOCLAST.

IDYL, *I dihl*, or **IDYLL.** The ancient Greeks originated a type of poem which pictured the lives of shepherds and farmers. Their name for a poem such as this meant *little picture*, and the term idyl comes from this name. It refers to a description or tale, in verse of moderate length, particularly one dealing with country, or pastoral, life.



The *Idyls* of the Greek author, Theocritus, serve as classic examples. Roman idyls are best represented by the *Bucolics* of Virgil. Renaissance poets also wrote idyls. The form came into English poetry with the *Shepheard's Calender*, by Spenser. The poem, *Idylls of the King*, by Tennyson, is actually a romantic epic. But since each division is treated as a separate picture, Tennyson chose to call each an idyll. See also EPIC. G.F.W.

IDYLLS OF THE KING is a series of poems by Lord Alfred Tennyson. They concern Arthur, the hero-king of the Britons, and his knights. Tennyson's Arthur resembles Queen Victoria's husband, Albert, more than he does either the supposed Celtic chieftain of history or Sir Thomas Malory's medieval king. The poem was completed in 1885, after Tennyson had worked on it off and on for fifty years. It is divided into twelve parts, called idyls. See IDYL.

Beginning with "The Coming of Arthur," the poet carries the story through to the final triumph of King Arthur's enemies and his death. He describes the building up of the kingdom and establishment of the Round Table, the unhappy love of Queen Guinevere for Lancelot, and the adventures of the knights in their search for the Holy Grail. The closing idyl has a description of "the last, dim battle of the west." Arthur's words from the funeral barge are often quoted:

> The old order changeth, yielding place to new,
> And God fulfills himself in many ways,
> Lest one good custom should corrupt the world.

See also ARTHUR, KING; EXCALIBUR; GALAHAD, SIR; ROUND TABLE; TENNYSON, ALFRED, LORD. G.F.R.

IGLOO, *IHG loo*, is the name which the Eskimo of Baffin Land give to a house built of blocks of snow. The Eskimo leave their summer tents of skin when winter sets in, and all the villagers work together to build new homes. Hard snow is cut into blocks which are built into a dome shape and made to fit exactly. Igloos for medicine men and hunters are built before those for any other villagers.

A doorway is left, and at the top of the house a piece of ice thin enough to let light in forms a window. The beds are blocks of frozen snow covered with leather and furs. The floor and inner walls are glazed by slightly melting the snow, smoothing it over, and allowing it to freeze again. Shelves are cut in the walls to hold tools, weapons, lamps, and cooking utensils. W.D.H.

See also ESKIMO (Eskimo Homes); HOME LIFE (color plate, Winter in the Far North).

IGNATIUS, *ig NA shus*, **SAINT,** was bishop of Antioch and one of the early Christian martyrs. He is supposed to have been born in Syria about the middle of the first century. Ignatius is said by some to have been the infant whom Christ took up in his arms (Mark 9). He protected his people against the persecutions of Domitian. About A.D. 107, Emperor Trajan had him thrown to the lions in the arena at Rome. The feast day of Saint Ignatius is February 1. His *Letters* are noteworthy documents of the early Christian Church. F.J.S.

IGNATIUS OF LOYOLA, SAINT. See LOYOLA, SAINT IGNATIUS OF.

Idols Are Often Found among Primitive Peoples. This Hawaiian idol is made of feathers and fibers like basketwork.

Metropolitan Museum of

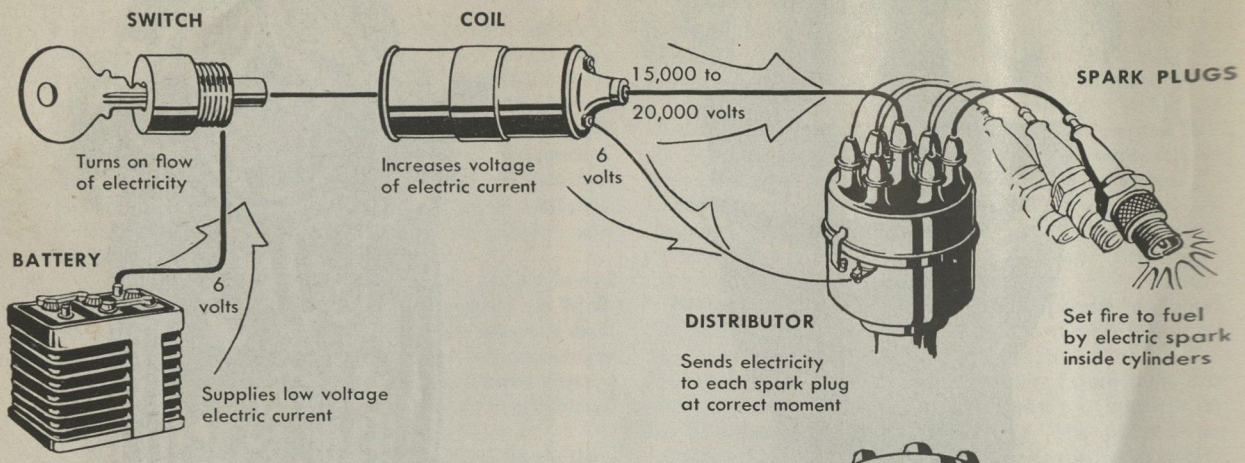
This Idol of New Guinea Has Two Human Skulls hu from long pegs that extend forward like outstretched arms.

A Huge Idol in Southern India was chiseled out of one block of granite into a beautiful work of art.

Sawy

This Ancient Idol Is in Bolivia. Scientists believe it was carv more than a thousand years ago. It weighs several tons.

HOW AN AUTOMOBILE IGNITION SYSTEM WORKS



IGNEOUS, *IG nee us*, **ROCK** was formed by the cooling and hardening of molten, or melted, material. When molten material is forced out of the earth, or *extruded*, it is called lava. Rocks formed from cooling lava are classified as *extrusive* or *volcanic* rocks. Basalt is an example of *extrusive rock*. Igneous rocks, formed from molten material which never reached the surface are called *intrusive*, or *plutonic* rocks. Granite is an example of this type of rock formed beneath the earth's surface.

When molten material freezes, it forms as a solid mass of crystals. The rock is called *crystalline*. In most plutonic rocks the individual crystals are large enough to be seen with the naked eye. These rocks are called *coarsely crystalline rocks*.

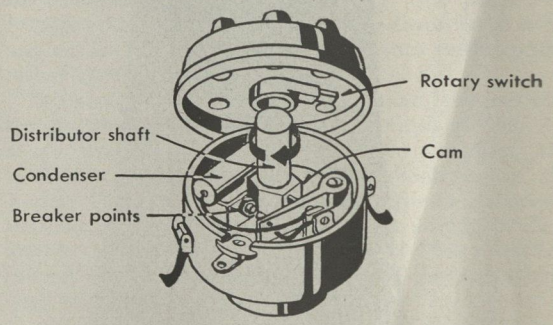
Volcanic rocks usually cool very rapidly. The individual crystals can be seen only through a microscope. They are called *finely crystalline* rocks. Sometimes a lava flow is chilled so quickly that its material cannot crystallize at all, but forms a glass. Such volcanic glass is called *obsidian*. Volcanic glass that is frothy with bubbles is called *pumice*. When a volcano throws lava from the earth with great violence, the masses of lava form lumps of rock ranging in size from volcanic dust to pieces of great size called volcanic bombs.

The minerals which an igneous rock may contain depend on the chemical composition of the molten material from which the rock was formed. Five kinds of minerals make up the largest part of all igneous rocks. They are *quartz*, *feldspar*, *mica*, *amphibole*, and *pyroxene*. One kind of igneous rocks called *gabbro* is made up of feldspar, iron ore, and magnesium. W.H.Bu.

Related Subjects. The reader is also referred to:

Basalt	Gneiss	Porphyry
Crystal and Crystallization	Granite	Pumice
Feldspar	Lava	Quartz
Geology	Mica	Rock

IGNIS FATUUS, *IG nis FAT yu us*, is a strange light that sometimes hovers over marshy places. It resembles a pale flame. People once believed it was usually seen in churchyards at night. It is sometimes called *will-o'-the-wisp*, *spunkie*, *jack-o'-lantern*, and other names. There has always been some doubt of its existence. Many scientists have investigated the ignis fatuus, but their findings have not been definite. Those who believe the ignis fatuus exists say it is the result of spontaneous combustion of gases. The expression *ignis fatuus* is from the Latin language, and means *foolish fire*. It was once thought to trap people who attempted to follow it in marshes. R.G.O.



The distributor is the brain of the ignition system. The distributor shaft is turned by the engine. The rotary switch whirls around, connecting each spark plug in turn with the high-voltage electricity. The cam also whirls, opening and closing the breaker points to interrupt the flow of low-voltage current through the coil. The condenser prevents sparks when the points open and close.

IGNITION means setting something on fire. Touching a burning match to paper is ignition. Usually, however, when we speak of ignition we mean setting fire to fuel to create power in an engine.

The ignition system of an engine must work quickly and accurately. For instance, the ignition system must send 200 electric sparks a second to the engine cylinders in an eight-cylinder automobile traveling at sixty miles an hour.

Most gasoline engines use ignition systems which set fire to the fuel with an electric spark. Such an ignition system must have (1) a source of electricity, (2) a device to increase the voltage of the electricity, (3) a breaker to determine the proper timing of the electrical impulses, (4) a distributor to send the electricity to each cylinder in proper order, (5) a spark gap in each cylinder, and (6) wiring and switches to tie the system together. The electric current is supplied by a battery or a magneto.

Battery Ignition is used in most automobile gasoline engines. Its main parts are the battery, the coil, the distributor, and the spark plugs. The battery supplies a low-voltage electric current. See STORAGE BATTERY.

The *coil* increases the voltage of the current. Inside the coil are two coils of wire. The *primary coil* is made up of several hundred turns of wire which is about as

big around as a straight pin. The primary coil is connected to the battery. The *secondary coil* has more than a mile of wire as fine as a hair. This wire is wound in more than 10,000 turns around the primary coil. The secondary coil is connected to the distributor. When the flow of low voltage in the primary coil is broken for an instant, it causes a high voltage to surge through the secondary coil. See ELECTRICITY (Electricity and Magnetism).

To break the low-voltage current, a pair of *breaker points* are included in the primary circuit. These breaker points are opened and closed rapidly by a rapidly revolving *cam*, or uneven wheel, inside the distributor housing. (See CAM.) The breaker points are closed for less than five thousandths of a second for each spark. These breaks in the primary circuit are timed to take place near the top of each piston's compression stroke as the fuel mixture is squeezed in the cylinder for firing. A *condenser* attached to the two breaker points draws off electricity that might otherwise cause a spark between the points when they open. The condenser also helps give a clean electrical break that is important in obtaining a hot, or high-voltage, spark in the cylinder.

The high voltage from the secondary coil runs to the *distributor*. There a whirling rotary switch sends the current to the *spark plugs*, one after another.

The electricity must be increased to a high voltage so it can push across the fraction-of-an-inch gap between the spark plug electrodes. This spark must be hot enough to set fire to the tightly compressed gasoline-air mixture in the cylinder. In engines with large cylinders, two spark plugs sometimes are used in each cylinder to burn the fuel evenly.

Magneto Ignition is used in most airplane piston engines. The magneto generates the electricity and transforms it into high voltage. The magneto also distributes the electricity to the spark plugs.

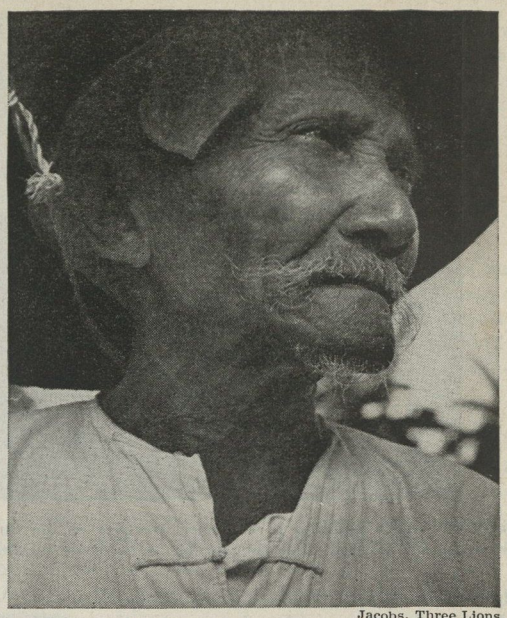
The advantage of the magneto system is that it does not have a battery to run down or wear out. Its biggest disadvantage is that, when the engine is being started, the magneto turns so slowly that it does not produce a hot spark, and an extra source of high voltage must be provided. See MAGNETO.

Other Ignition Systems. In Diesel engines the fuel mixture is ignited by compressing it so tightly that it sets itself on fire. In jet engines the fuel is ignited by the heat of the combustion chamber walls, or by spark plugs. F.M.R.

See DIESEL ENGINE; GASOLINE ENGINE; INDUCTION COIL; JET PROPULSION.

IGOROT, *ee goh ROHT*, or **IGORROTE,** *ee gohr RO tay*, is a Philippine word which means *mountain people*. This name is given to certain native tribes of Northern Luzon in the Philippine Islands. The Igorot are of a Mongoloid stock known as Malaysian. They average only about five feet tall, are brown skinned, and have straight dark hair and dark eyes. There are at least 100,000 Igorot living in mountain districts.

Some Igorot were head-hunters until United States troops subdued them and persuaded them to adopt a more peaceful way of life. Most of them are farmers. Some of their houses have two stories. The lower story is used as a workshop and living room, and the upper serves as a storeroom and kitchen. W.M.KR.



Jacobs, Three Lions

A Typical Member of the Igorot Tribe on the Island of Luzon, the largest of the Philippine Islands. Before the islands were occupied by Americans, the Igorot were warlike, but they have now become peaceful citizens and skillful farmers.

See also PHILIPPINE ISLANDS (The People).

IGUANA, *ih GWAH nah.* The iguana is a large green lizard that lives in the trees in forests of tropical America. Its total length, including the tail, may be five feet. The tail is remarkably long and has black bands. The iguana has a crest of scales like a comb down the middle of its back. This crest and a large flap of skin that hangs down from the throat give it a grotesque appearance. This lizard lays eggs. It feeds chiefly on various kinds of tropical plants.

The iguana is a timid, somewhat stupid creature, and is easily caught by the natives. It is fond of staying in branches that hang over the water, and leaps in for safety when it is frightened. Iguanas are excellent swimmers, and do not hesitate to drop from great heights into

Ewing Galloway

The Iguana, or Giant Lizard, Looks Very Fierce, but it is really a timid animal. Natives of the countries in which it lives eat its flesh. If it were not protected by law, it would soon be extinct, like the dinosaur, which it resembles.

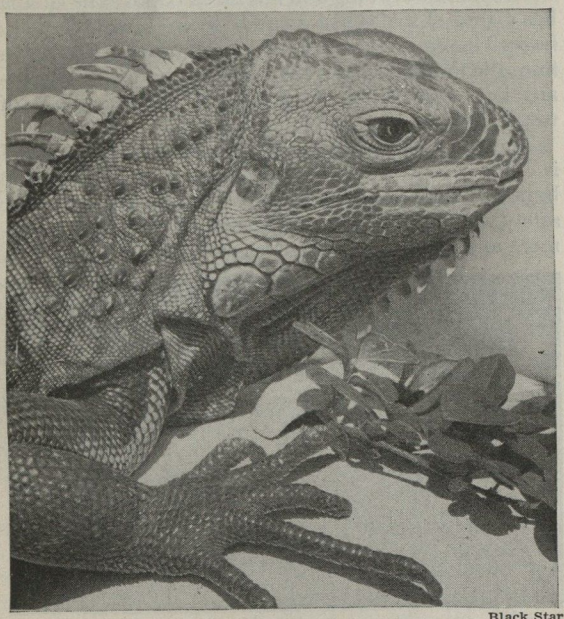
N. Y. Zoological Society

The Rhinoceros Iguana is so named because of the three blunt horns on its snout. The species has a habit of squatting flat upon the hindquarters with the forward portion of the body reared high on its front legs. This iguana is very rare.

a lake or river and then swim to safety.

Iguana flesh is considered a great delicacy. The lizards are often seen in markets with their legs tied up over their backs by their own tendons. This cruel practice leaves the lizards completely helpless.

Various other large lizards of the family *Iguanidae* are also called iguanas. This family is widespread in the New World, but has only a few members in the Old World. One of these, the *desert iguana*, or *keelbacked lizard*, lives in the deserts of the southwestern United States and northern Mexico. It is about a foot long, and has a thick body, very small head, and long tapering tail.



Black Star

The Iguana's Long Claws are used for climbing trees. In this illustration the big pouch under the lower jaw is not puffed out. The spines along the back look like the teeth of a saw. The iguana's tail is much longer than its body.

Other examples are the *rhinoceros iguana* of the island of Hispaniola, and the *marine iguana* of the Galapagos Islands. The marine iguana is the only lizard known that dwells in the sea surf. Its food is seaweed. A land species of this region burrows in the ground. C.H.Po.

See also LIZARD.

Classification. The iguana belongs to the family *Iguanidae*. Its scientific name is *Iguana iguana*. The desert iguana is *Callisaurus draconoides*. The rhinoceros iguana is *Cyclura cornuta*. The Galapagos iguana is *Amblyrhynchus cristatus*.

IGUANODON, *ih GWAN oh dahn.* See DINOSAUR.

IGUASSU, *ee gwah SOO*, or **IGUAZU, FALLS.** See PARANA RIVER.

I.H.S. are three letters which often appear on altar cloths, vestments, and the like in Episcopal and Roman Catholic Churches. Originally they were the first three letters of the Greek word "Jesus." Through error in translation they now are used to mean *Jesus Hominum Salvator*, "Jesus, Savior of Men." They are often taken incorrectly to mean *In hoc signo vinces*, "By this sign thou wilt conquer." F.J.S.

IJSSEL, *ICE el*, **RIVER.** See NETHERLANDS, THE (The Land and Its Resources).

IKHNATON, or **AKHENATON,** also known as **AMENHOTEP IV.** (Reigned about 1375-1358 B.C.). See EGYPT (Egypt of the Pharaohs); TUTANKHAMEN.

IKHWAN, *IHK wahn*, are members of a Moslem group in central Arabia who believe in the teachings of Abd-al-Wahab. This Arab reformer founded his new religious sect in 1745 when he proclaimed himself the reformer of Islam. The word *Ikhwan* means *brothers*. Early in the 1900's, Abdul-Aziz ibn-Saud, persuaded 50,000 wandering Ikhwan, or Wahabis, to settle in communities which are also called Ikhwan.

IKON, or **ICON.** See ICON.

ÎLE DE FRANCE. See MAURITIUS.

ILEUM, *IHL ee um.* See ALIMENTARY CANAL.

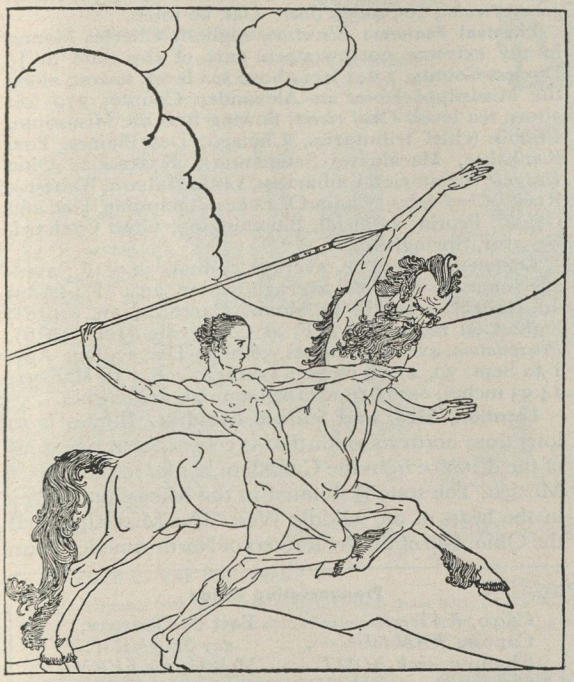
ILEX, *I leks.* See OAK.

ILIAC, *IHL ih ack*, **ARTERY.** See ARTERY.

ILIAD. Some of the myths and tales of the most ancient period of Greek life survive in two famous epic poems, the *Iliad* and the *Odyssey*. These works are so beautiful that they still remain among the greatest epics ever written. Tradition says that they were composed by the ancient wandering Greek minstrel, Homer, around the ninth century B.C. But the greatest scholars have never determined whether Homer actually wrote them or whether he only put them into final form. There is some doubt that Homer really lived at all.

The Story. The *Iliad* consists of twenty-four books which describe an episode of the Trojan War during a period of only forty-nine days. Most of the story deals with the anger of the hero, the great Achilles, and its tragic results to the Greeks. Achilles became angry because of an insult from his commander, Agamemnon.

Achilles left the battlefield in rage, and went to his tent to sulk. His absence caused the Greeks to suffer repeated defeats, but he showed no concern when he heard of these. His attitude led the Trojans to believe that he hated Agamemnon more than he did them. They thus felt safe enough to prepare to burn the Greek camp. Patroclus, the relative and best friend of Achilles, asked for his armor. After Achilles gave it to Patroclus, he put it on and went into battle. His death at the hands of the Trojan leader, Hector, stirred Achilles to meet and kill Hector. Achilles then dragged the body of the brave Trojan at his chariot wheels. But Priam, the aged father of Hector, pleaded for the body, and Achilles finally gave it up. The poem ends with an account of the funeral services and the burning of Hector's body.



The Young Achilles Was Trained by the Centaur, Chiron. This illustration was drawn by Willy Pogany for "The Adventures of Odysseus and the Tale of Troy," written by the Irish author, Padraic Colum, and published by Macmillan.

Its Value. The *Iliad* tells a fascinating story in a direct and simple manner. It is always noble in thought, and its lines are rhythmical and majestic. It also serves as a record of the ancient world. H.M.H.

Related Subjects. The reader is referred to:

Achilles	Helen of Troy	Paris
Aeneid	Homer	Troy
Agamemnon	Menelaus	Ulysses
Epic	Odyssey	Wooden Horse
Hector		

ILIC, *EE leet y'*, or *EE lich*, is the family name of three Serbian writers. The father was Jovan Ilic (1823-1901). In addition to his poetry writing, he was a member of the Serbian Supreme Court and for four years served as Serbian Minister of Justice. The two sons are Dragutin (1858-) and Vojislav (1862-1894).

ILIN, M. (1895-), is the pen name of Ilia Iakovlevich Marshak, a Soviet writer of children's books. He studied chemistry at the Leningrad Technological Institute, and went to work as an industrial chemist. Later, he began writing books on scientific subjects for children. *Sun on the Table* discusses the problem of lighting. *The Story of a Great Plan* describes the building of a factory. M. Ilin's books reflect Soviet Communist teachings. L.J.

ILIUM, *IHL ih um*. See PELVIS.

ILIUM. See TROY, or ILIUM.

ILLAMPU, *ee YAHM poo*. This triple-crested, snow-capped peak lies in Bolivia about twelve miles east of Lake Titicaca. The peak rises 21,276 feet above sea level. M.U.

See ANDES MOUNTAINS.

ILLECILLEWAET, *IHL eh SIL eh wayt*, **GLACIER.** See SELKIRK MOUNTAINS.

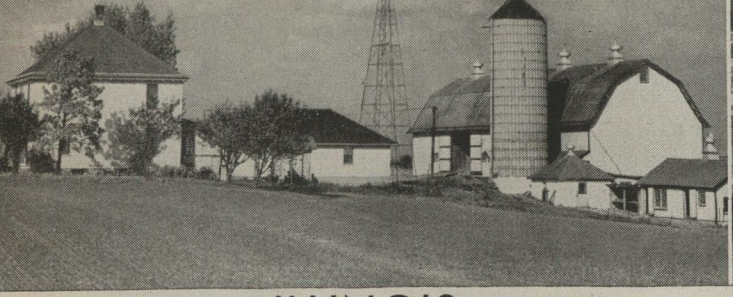
ILLICIUM, *ih LIS ih um*, is the name of a group of shrubs and trees which belong to the magnolia family. Several, such as the star anise, are found in southeastern United States, but most of them grow in Asia. The star anise is about nine feet high. The evergreen leaves are very fragrant and are borne on short stalks. The flowers are purplish red with about ten petals. The fruits grow in a star-shaped cluster and smell of anise. J.J.L.

Classification. The star anise, *Illicium verum*, belongs to the family *Magnoliaceae*.

ILLIMANI, *EE yee MAH nee*, is a mountain peak in the central Andes of South America. It is one of the highest (21,184 feet) mountains in Bolivia. See ANDES MOUNTAINS (Physical Features).

ILLINGTON, MARGARET (1881-1934), was the stage name of Maude Light, an American actress. She took her professional name from the names of the city and state of her birth, Bloomington, Ill. She played the leading part with E. H. Sothern in *If I Were King*, and starred in many other plays.

ILLINIUM, *ih LIN ih um*, is the former name of the chemical element promethium. This element was originally called *illinium* after the name *Illinois*, because its discovery was credited to scientists at the University of Illinois. The name was officially changed to *promethium* in 1949, after the element had been isolated at the Oak Ridge (Tenn.) National Laboratory for atomic research. The atomic number of promethium is 61. See also PROMETHIUM.



ILLINOIS THE PRAIRIE STATE

International Harvester; Ewing Galloway

ILLINOIS, *ihl ih NOY*, takes its name from the Indian word *Illini*, meaning *man*. This was the name of the Indian tribes who first lived in the Illinois country. Illinois has also long been known as THE PRAIRIE STATE, because of its stretches of prairie grassland. Another popular name for Illinois is THE SUCKER STATE. This name is usually traced back to the miners at Galena in the 1820's. Large numbers of men came to work at the Galena mines, then left in a short time. The regular miners said these men were like the fish called suckers, which came up the river in spring and "returned down ag'in in the fall."

The names of famous men are written in the pages of Illinois history. These include such daring French explorers as Joliet, Marquette, Tonti of the Iron Hand, and La Salle. Illinois was the scene of many of the exploits of George Rogers Clark and his warriors. Abraham Lincoln lived in New Salem and Springfield before he became President of the United States.

Since the pioneer days, Illinois has become the transportation center of the United States. Great transportation lines from east, west, north, and south meet at Chicago, which is the second largest city in the Western Hemisphere. Highways, railroads, and airways cross Illinois in every direction. Large quantities of farm crops come from the fertile fields of the state. Millions of people obtain food and other products from the livestock raised in Illinois pastures and feed lots. A steady flow of manufactured goods comes from Illinois factories, mills, and forges. Only New York and Pennsylvania have manufactures of greater value, larger populations, and greater wealth than Illinois.

Illinois is the greatest livestock-slaughtering and meat-packing center in the world. It leads the states in the manufacture of farm machinery, candy, and products made from corn. Chicago is one of the world's largest grain markets. Illinois grows more soybeans than any other state. It is also one of the most important areas in the United States for the raising of dairy cattle and poultry, and for truck-garden farming. Illinois ranks second only to Iowa in the income received from the sale of hogs and cattle. Illinois ranks fourth among the states in the income received from farm crops. The state is rich in minerals. It leads the country in the mining of fluorite, tripoli, and silica sand. Large quantities of coal and oil also are produced.

Illinois is famous for its many museums, libraries, colleges, and universities. Large numbers of persons come to the state every year to visit the many sites of scenic and historical interest.

The Land and Its Resources

Extent: *Area*, 56,400 square miles (453 square miles of which are inland water; in addition, there are 1,526 square miles of Lake Michigan water surface); twenty-third in size among the states. *Greatest length*, 380 miles; *greatest width*, 205 miles. *Shore Line*, 60 miles.

Physical Features: *Elevation*, highest, Charles Mound in the extreme northwestern part of the state in Jo Daviess County, 1,241 feet above sea level; lowest, along the Mississippi River in Alexander County, 279 feet above sea level. *Chief rivers*, flowing into the Mississippi, Illinois (chief tributaries, Chicago, Des Plaines, Fox, Kankakee, Mackinaw, Sangamon), Kaskaskia, Ohio (largest tributaries, Embarrass, Little Wabash, Wabash), Rock. *Chief lakes*, Chain O' Lakes (including Fox and Grass), Peoria; artificial, Bloomington, Crab Orchard, Decatur, Springfield.

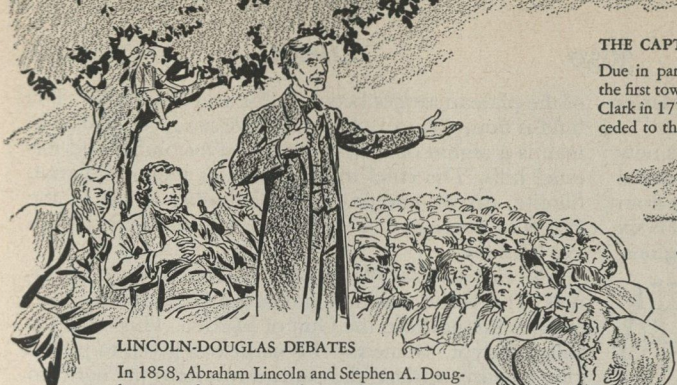
Climate: *Temperature*, average annual, 52.7° F.; average summer, 74.4° F.; average winter, 29.4° F.; lowest on record, −35° F. at Mount Carroll (Jan., 1930); highest on record, 115° F. at Greenville (July, 1936). *Precipitation*, average annual, 36.61 inches; average Apr. 1 to Sept. 30, 21.68 inches; average Oct. 1 to Mar. 31, 14.93 inches. *Snowfall*, average annual, 21.6 inches.

Location, Size, and Surface Features. Illinois is so long from north to south that it covers about one third of the distance from the Canadian border to the Gulf of Mexico. The state is situated in the Mississippi Valley in the heart of the Middle West. The Mississippi and the Ohio, two of the great rivers of North America, form

Pronunciation Guide

Cairo, *KAY roh*
Canton, *KAN tohn*
Chanute, *shah NOOT*
Crevecoeur, *krev KUHR*
Decatur, *dee KAY ter*
Des Plaines, *deh PLAYN*
Embarrass, *AM braw*
Fort de Chartres, *day SHAHR tr*
Moline, *mo LEEN*
Nauvoo, *noh VOO*
Prairie du Rocher, *doo RO shay*
Rantoul, *ran TOOL*

MEMORABLE ILLINOIS EVENT

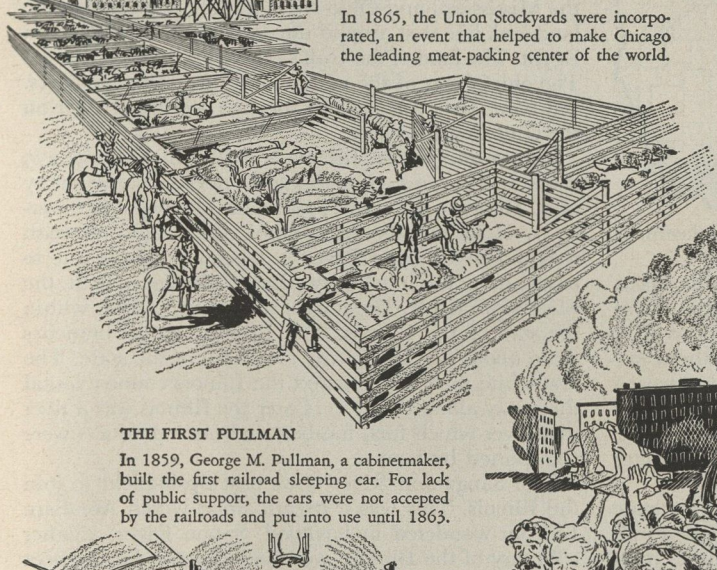


LINCOLN-DOUGLAS DEBATES

In 1858, Abraham Lincoln and Stephen A. Douglas engaged in a series of seven famous debates on slavery, the burning question of the day.

THE CAPTURE OF KASKASKIA

Due in part to the capture of Kaskaskia, the first town in Illinois, by George Rogers Clark in 1778, the Northwest Territory was ceded to the United States by the English.

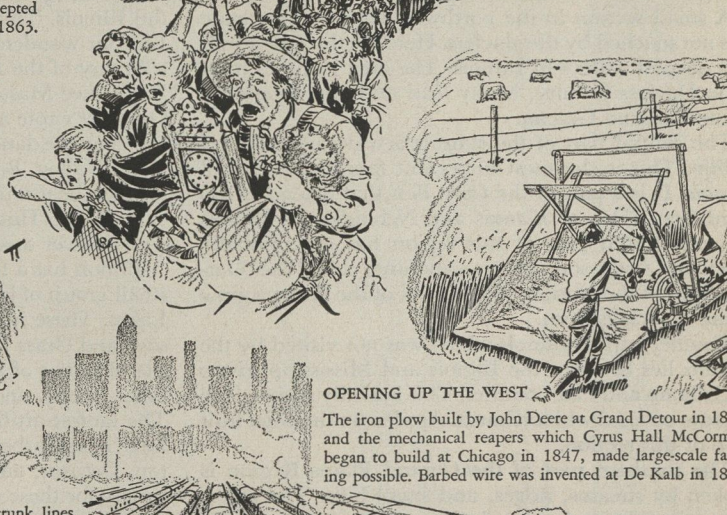


UNION STOCKYARDS

In 1865, the Union Stockyards were incorporated, an event that helped to make Chicago the leading meat-packing center of the world.

THE FIRST PULLMAN

In 1859, George M. Pullman, a cabinetmaker, built the first railroad sleeping car. For lack of public support, the cars were not accepted by the railroads and put into use until 1863.

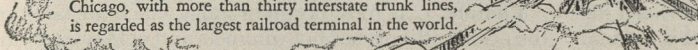


THE GREAT CHICAGO FIRE

In October, 1871, a disastrous fire destroyed property v about $196,000,000, and rendered 100,000 persons h

OPENING UP THE WEST

The iron plow built by John Deere at Grand Detour in 18 and the mechanical reapers which Cyrus Hall McCorm began to build at Chicago in 1847, made large-scale fa ing possible. Barbed wire was invented at De Kalb in 18

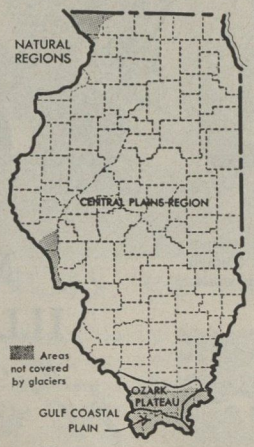


HUB OF THE CONTINENT

Chicago, with more than thirty interstate trunk lines, is regarded as the largest railroad terminal in the world.

parts of the boundaries of the state. For the boundaries of Illinois, see the colored map.

Glaciers once covered most of the area which is now Illinois. The sliding glaciers scraped the surface of the land into a rolling plain. This plain slopes gently from north to south. The average height above sea level is six hundred feet. Illinois is divided into three natural regions, the Central Plains, the Ozark Plateau, and the Gulf Coastal Plain.



The *Central Plains Region* covers about 90 per cent of the area of the state. The plains region includes all except the southern tip of Illinois. This large region is divided into several smaller sections. A world-famous industrial and shipping region lies in the northeast along the shores of Lake Michigan. This section includes Chicago and the area in a fifty-mile circle around the city. The land was once part of the bottom of Lake Michigan. It is level and fertile, and good for farming, truck gardening, and dairying.

The surface of the land is broken by small hills, lakes, and marshes north and west of the Chicago area. These surface formations were made by the glaciers as they crept down from the north ages ago. This northern section has a cooler climate and a shorter growing season than the rest of the region. The surface is rough, and is not good for crop farming. The raising of dairy cattle is the chief industry. Beef cattle, hogs, sheep, and poultry also are raised in this section.

A small section in the northwest corner of the state was not touched by the glaciers. Here are the tallest hills and deepest valleys in Illinois. The area includes most of Jo Daviess County. Many lead and zinc mines are located around Galena.

The central part of the state is a wide area of level prairie. This is the most important farming section of Illinois. It is a part of the Corn Belt that extends westward from Ohio to Kansas and Nebraska. In Illinois the east-central part of this region has exceptionally black and fertile soil. This is sometimes called the "Garden Spot of the Nation." Here most of the farmers grow grain, especially corn.

Another part of Illinois which was not visited by the glaciers lies between the Illinois and Mississippi rivers in Calhoun and Pike counties. This is a hilly region. The hills are covered with orchards. Apples are the chief fruit crop of this section.

The southern part of the Central Plains Region is broken by streams, ridges, and small hills. The soil is lighter in color and not as fertile as the land toward the south. Grain and hay are the chief crops of this section. They are fed to hogs and cattle. Larger numbers of sheep and poultry also are raised here. The chief orchard crops of the area are apples, peaches, and pears.

The *Ozark Plateau Region* stretches across the southern part of the state for about seventy miles. The width of the plateau ranges between five and forty miles. The land is from 300 to 1,065 feet above sea level. This plateau is a region of valleys, woods, river bluffs, and forested hills. The chief minerals of this region are coal, fluorite, tripoli, and lead. Some lumber is cut in the forests of the region. There are many fruit orchards on the hillsides.

The *Gulf Coastal Plain* covers the southern tip of Illinois. This is the northern end of the Great Plain which extends inland from the Gulf of Mexico. This region is called "Egypt." Some say this name was given to the region by early settlers who came down from the north to get grain, as travelers did in the Bible story of Joseph. Others say the region is called Egypt because of such Egyptian names for towns as Cairo and Thebes. Still others think the name was given because the meeting of the Mississippi and Ohio rivers in the region makes the land look like that around the delta of the Nile River in Egypt. The land of the Gulf Coastal Plain is very fertile. The chief crops of the region are fruits and vegetables. But corn, hay, cotton, and tobacco are also grown on the Gulf Coastal Plain.

Rivers and Lakes. Illinois is well drained by its 275 rivers and streams, even though it does not have many hills. The state has about 1,000 miles of navigable waterways, including the Mississippi, Ohio, and Wabash rivers. The Chicago River is especially important to navigation, for it connects Lake Michigan with the Mississippi River. The largest river lying entirely within the state is the Illinois. The Illinois and its branches drain about one half of the total area of the state. The first white men who entered the Illinois country found their way along this river. Later the Illinois was a river road over which furs, lumber, and farm products were transported by boat.

The Sangamon River flows past Springfield to join the Illinois. This was a stream along which Abraham Lincoln wandered in boyhood. Spoon River, another tributary of the Illinois, was made famous by the poet Edgar Lee Masters in his *Spoon River Anthology*. Percy Grainger wrote a piano solo, "Spoon River," which was based on the dance tunes of pioneer fiddlers in the Spoon River Valley. Both the Rock and Fox rivers are noted for their beautiful valleys. The Rock River is sometimes called "The Hudson of the West" because it furnishes water power to several manufacturing cities.

Illinois has a long shore line on Lake Michigan. One small group of lakes in the northeast is called Chain O' Lakes. These include Fox Lake, a popular summer resort, and Grass Lake, which is covered in summer with the blossoms of the Egyptian lotus. There are artificial lakes, ponds, and reservoirs in every county of Illinois. The largest artificial lake in the state is Crab Orchard Lake near Carbondale. Others are located at Bloomington, Decatur, and Springfield and are sources of water supply for these cities.

Climate. Like most northern states which are far from the ocean, Illinois has hot summers and cold winters. In the northeast, around Chicago, the extremes of hot and cold are relieved somewhat by the winds off the Great Lakes. The growing season is about two months longer in the south than in the northern part of the state. Rapid changes of temperature are common throughout Illinois,

ILLINOIS

Population 8,712,

Counties

Adams, 64,690 ..... D 2
Alexander, 20,316 ..... F 4
Bond, 14,157 ..... E 4
Boone, 17,070 ..... A 5
Brown, 7,132 ..... D 3
Bureau, 37,711 ..... B 4
Calhoun, 6,898 ..... D 3
Carroll, 18,976 ..... A 4
Cass, 15,097 ..... D 3
Champaign, 106,100 ..... C 5
Christian, 38,816 ..... D 4
Clark, 17,362 ..... D 6
Clay, 17,445 ..... E 5
Clinton, 22,594 ..... E 4
Coles, 40,328 ..... D 5
Cook, 4,508,792 ..... B 6
Crawford, 21,137 ..... D 6
Cumberland, 10,496 ..... D 5
De Kalb, 40,781 ..... B 5
De Witt, 16,894 ..... C 5
Douglas, 16,706 ..... D 5
Du Page, 154,599 ..... B 5
Edgar, 23,407 ..... D 6
Edwards, 9,056 ..... E 5
Effingham, 21,675 ..... D 5
Fayette, 24,582 ..... D 4
Ford, 15,901 ..... C 5
Franklin, 48,685 ..... E 5
Fulton, 43,716 ..... C 3
Gallatin, 9,818 ..... F 5
Greene, 18,852 ..... D 3
Grundy, 19,217 ..... B 5
Hamilton, 12,256 ..... E 5
Hancock, 25,790 ..... C 2
Hardin, 7,530 ..... F 5
Henderson, 8,416 ..... C 3
Henry, 46,492 ..... B 3
Iroquois, 32,348 ..... C 6
Jackson, 38,124 ..... F 4
Jasper, 12,266 ..... E 5
Jefferson, 35,892 ..... E 5
Jersey, 15,264 ..... D 3
Jo Daviess, 21,459 ..... A 3
Johnson, 8,729 ..... F 5
Kane, 150,388 ..... B 5
Kankakee, 73,524 ..... B 6
Kendall, 12,115 ..... B 5
Knox, 54,366 ..... B 3
Lake, 179,097 ..... A 6
La Salle, 100,610 ..... B 5
Lawrence, 20,539 ..... E 6
Lee, 36,451 ..... B 4
Livingston, 37,809 ..... C 5
Logan, 30,671 ..... C 4
McDonough, 28,199 ..... C 3
McHenry, 50,656 ..... A 5
McLean, 76,577 ..... C 5
Macon, 98,853 ..... D 5
Macoupin, 44,210 ..... D 4
Madison, 182,307 ..... E 4
Marion, 41,700 ..... E 5
Marshall, 13,025 ..... B 4
Mason, 15,326 ..... C 4
Massac, 13,594 ..... F 5
Menard, 9,639 ..... C 4
Mercer, 17,374 ..... B 3
Monroe, 13,282 ..... E 3
Montgomery, 32,460 ..... D 4
Morgan, 35,568 ..... D 3
Moultrie, 13,171 ..... D 5
Ogle, 33,429 ..... A 4
Peoria, 174,347 ..... C 4
Perry, 21,684 ..... E 4
Piatt, 13,970 ..... D 5
Pike, 22,155 ..... D 3
Pope, 5,779 ..... F 5
Pulaski, 13,639 ..... F 4
Putnam, 4,746 ..... B 4
Randolph, 31,673 ..... E 4
Richland, 16,889 ..... E 5
Rock Island, 133,558 ..... B 3
St. Clair, 205,995 ..... E 4
Saline, 33,420 ..... F 5
Sangamon, 131,484 ..... D 4
Schuyler, 9,613 ..... C 3
Scott, 7,245 ..... D 3
Shelby, 24,434 ..... D 5
Stark, 8,721 ..... B 4
Stephenson, 41,595 ..... A 4
Tazewell, 76,165 ..... C 4
Union, 20,500 ..... F 4
Vermilion, 87,079 ..... C 6
Wabash, 14,651 ..... E 6
Warren, 21,981 ..... C 3
Washington, 14,460 ..... E 4
Wayne, 20,933 ..... E 5
White, 20,935 ..... E 5
Whiteside, 49,336 ..... B 3
Will, 134,336 ..... B 6
Williamson, 48,621 ..... F 5
Winnebago, 152,385 ..... A 4
Woodford, 21,335 ..... C 4

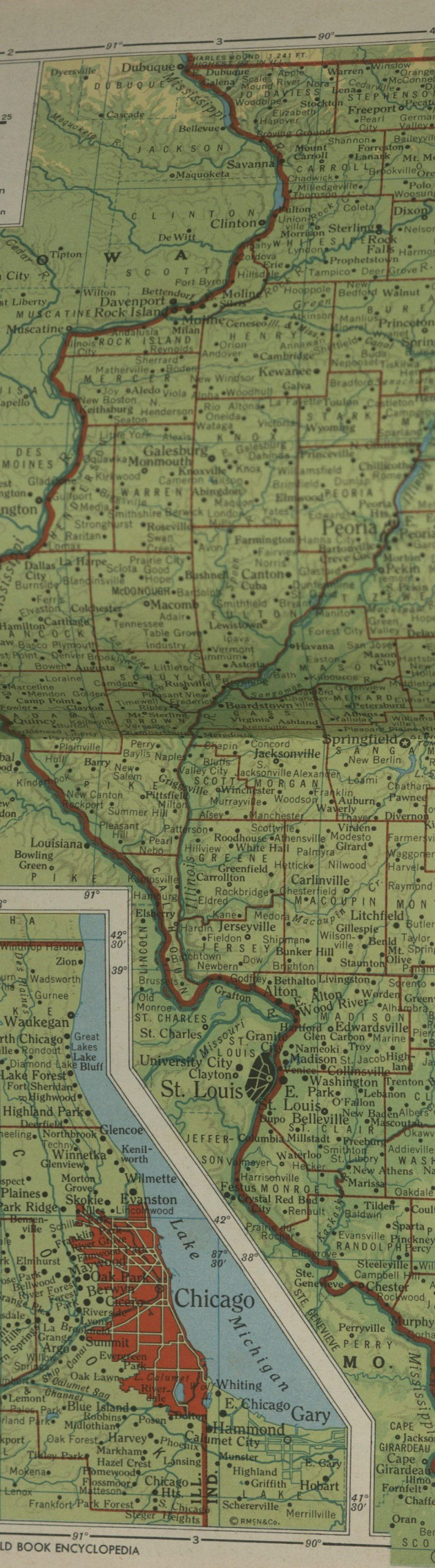
Cities

o Indicates County Seat

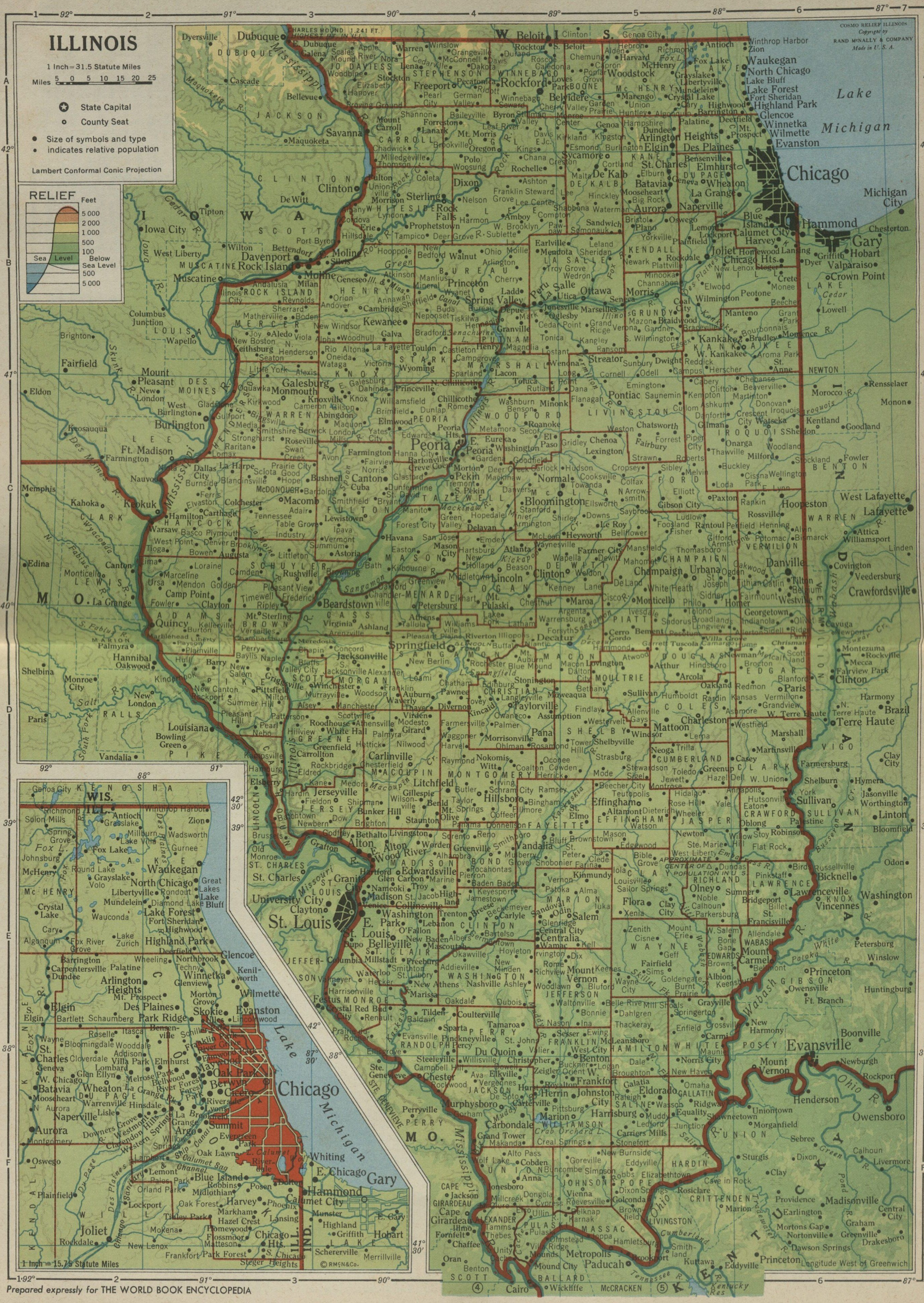
Abingdon, 3,300 ..... C 3
Adair, 350 ..... C 3
Addison, 813 ..... F 2
Adeline,* 1,135 ..... A 4
Albany, 544 ..... B 3
Albion, 2,287 ..... oE 5
Aledo, 2,919 ..... oB 3
Alexis, 821 ..... B 3
Algonquin, 1,223 ..... A 5, E 2
Alhambra, 476 ..... E 4
Allendale, 442 ..... E 6
Alma, 404 ..... E 5
Alorton,* 2,547 ..... E 4
Alpha, 630 ..... B 3
Alsip,* 1,228 ..... B 6
Altamont, 1,580 ..... D 5
Alton, 32,550 ..... E 3
Altona, 462 ..... B 3
Alto Pass, 462 ..... F 4
Amboy, 2,128 ..... B 4
Andalusia, 510 ..... B 3
Anna, 4,380 ..... F 4
Annawan, 592 ..... B 4
Antioch, 1,307 ..... A 5, D 2
Apple River, 431 ..... A 3
Arcola, 1,700 ..... D 5
Arenzville, 513 ..... D 3
Argenta, 575 ..... D 5
Arlington Heights, 8,768 ..... A 5, E 2
Aroma Park, 544 ..... B 6
Arthur, 1,573 ..... D 5
Ashkum, 420 ..... C 6
Ashland, 1,039 ..... D 3
Ashley, 738 ..... E 4
Ashmore, 406 ..... D 5
Ashton, 913 ..... B 4
Assumption, 1,466 ..... D 4
Astoria, 1,308 ..... C 3
Athens, 1,048 ..... D 4
Atkinson, 825 ..... B 3
Atlanta, 1,331 ..... C 4
Atwood, 661 ..... D 5
Auburn, 1,963 ..... D 4
Augusta, 945 ..... C 3
Aurora, 50,576 ..... B 5, F 1
Ava, 734 ..... F 4
Avon, 870 ..... C 3
Baldwin, 354 ..... E 4
Barrington, 4,209 ..... A 5, E 2
Barry, 1,529 ..... D 2
Bartlett, 716 ..... E 2
Bartonville, 2,437 ..... C 4
Batavia, 5,838 ..... B 5, F 1
Bath, 423 ..... C 3
Beardstown, 6,080 ..... C 3
Beaverville, 383 ..... C 6
Beckemeyer, 1,045 ..... E 4
Beecher, 956 ..... B 6
Beecher City, 437 ..... D 5
Belgium, 493 ..... C 6
Belleville, 32,721 ..... oE 4
Bellevue,* 1,529 ..... C 4
Bellflower, 413 ..... C 5
Bellmont, 368 ..... E 6
Bellwood, 8,746 ..... F 2
Belvidere, 9,422 ..... oA 5
Bement, 1,459 ..... D 5
Benld, 2,093 ..... D 4
Bensenville, 3,754 ..... B 6, E 2
Benson, 387 ..... C 4
Benton, 7,848 ..... oE 5
Berkeley,* 1,882 ..... B 6
Berwyn, 51,280 ..... F 2
Bethalto, 2,115 ..... E 3
Bethany, 850 ..... D 5
Bible Grove, 578 ..... E 5
Biggsville, 379 ..... C 3
Big Rock, 350 ..... B 5
Bismarck, 450 ..... C 6
Blandinsville, 918 ..... C 3
Bloomingdale, 339 ..... E 2
Bloomington, 34,163 ..... oC 5
Blue Island, 17,622 ..... B 6, F 3
Blue Mound, 886 ..... D 4
Bluffs, 784 ..... D 3
Bluford, 477 ..... E 5
Bourbonnais, 1,598 ..... B 6
Bowen, 573 ..... C 2
Braceville, 384 ..... B 5
Bradford, 952 ..... B 4
Bradley, 5,699 ..... B 6
Braidwood, 1,485 ..... B 5
Breese, 2,181 ..... E 4
Bridgeport, 2,358 ..... E 6
Bridge View,* 1,393 ..... B 6
Brighton, 934 ..... C 4
Brimfield, 648 ..... C 4
Bristol, 541 ..... B 5
Broadview,* 5,196 ..... B 6
Brocton, 406 ..... D 6
Brookfield, 15,472 ..... F 2
Brooklyn,* 2,568 ..... E 4
Brookport, 1,119 ..... F 5
Browns, 336 ..... E 6
Brownstown, 649 ..... D 5
Bryant, 396 ..... C 3
Buckley, 554 ..... D 4
Buckner, 783 ..... F 4
Buda, 761 ..... B 4
Buffalo, 416 ..... D 4
Bureau, 480 ..... B 4
Burnham,* 1,331 ..... B 6
Bushnell, 3,317 ..... C 3
Byron, 1,237 ..... A 4
Cairo, 12,123 ..... oF 4
Calumet City, 15,799 ..... B 6, F 3
Calumet Park,* 2,500 ..... B 6
Cambridge, 1,489 ..... oB 3
Campbell Hill, 336 ..... F 4
Camp Point, 969 ..... C 2
Canton, 11,927 ..... C 3
Capron, 572 ..... A 5
Carbondale, 10,921 ..... F 4
Carlinville, 5,116 ..... oD 4
Carlyle, 2,669 ..... oE 4
Carmi, 5,574 ..... oE 5
Carpentersville, 1,523 ..... F 2
Carriers Mills, 2,252 ..... F 5
Carrollton, 2,437 ..... oD 3
Carterville, 2,716 ..... F 4
Carthage, 3,214 ..... oC 2
Cary, 943 ..... A 5, E 2
Casey, 2,734 ..... D 6
Caseyville,* 1,209 ..... E 4
Catlin, 953 ..... C 6
Cave in Rock, 550 ..... F 5
Cedarville, 466 ..... A 4
Central City, 1,231 ..... E 4
Centralia, 13,863 ..... E 4
Central Park,* 2,489 ..... C 6
Cerro Gordo, 1,052 ..... D 5
Chadwick, 607 ..... A 4
Champaign, 39,563 ..... C 5
Chandlerville, 788 ..... C 3
Channahon, 400 ..... B 5
Channel,* 1,218 ..... A 6
Chapin, 489 ..... D 3
Charleston, 9,164 ..... oD 5
Chatham, 905 ..... D 4
Chatsworth, 1,119 ..... C 5
Chebanse, 739 ..... C 6
Chenoa, 1,452 ..... C 5
Cherry, 520 ..... B 4
Cherry Valley, 741 ..... A 5
Chester, 5,389 ..... oF 4
Chicago, 3,620,962 ..... oB 6, F 3
Chicago Heights, 24,551 ..... B 6, F 3
Chillicothe, 2,767 ..... C 4
Chrisman, 1,071 ..... D 6
Christopher, 3,545 ..... F 4
Cicero, 67,544 ..... F 3
Cisne, 628 ..... E 5
Cissna Park, 660 ..... C 6
Clarendon Hills, 2,437 ..... F 2
Clay City, 1,103 ..... E 5
Clayton, 866 ..... C 3
Clifton, 734 ..... C 6
Clinton, 5,945 ..... oC 5
Cloverdale,* 1,432 ..... C 4
Coal City, 2,220 ..... B 5
Coalton, 402 ..... D 4
Cobden, 1,104 ..... F 4
Coffeen, 627 ..... D 4
Colchester, 1,551 ..... C 3
Colfax, 819 ..... C 5
College Park-Highland Park,* 1,058 ..... F 5
Collinsville, 11,862 ..... E 4
Columbia, 2,179 ..... E 3
Cordova, 475 ..... B 3
Cornell, 458 ..... C 5
Cottage Hills,* 3,357 ..... E 4
Coulterville, 1,160 ..... E 4
Cowden, 619 ..... D 5
Creal Springs, 864 ..... F 5
Crete, 2,298 ..... B 6
Creve Coeur, 5,499 ..... C 4
Crossville, 866 ..... E 5
Crotty,* 1,435 ..... B 5
Crystal Lake, 4,832 ..... A 5, E 1
Cuba, 1,482 ..... C 3
Cullom, 492 ..... C 5
Cypress, 357 ..... F 4
Dahlgren, 609 ..... E 5
Dallas City, 1,275 ..... C 2
Dalton City, 384 ..... D 5
Danforth, 385 ..... C 6
Danvers, 762 ..... C 4
Danville, 37,864 ..... oC 6
Davis, 348 ..... A 4
Decatur, 66,269 ..... oD 5
Deer Creek, 501 ..... C 4
Deerfield, 3,288 ..... A 6, E 2
De Kalb, 11,708 ..... B 5
De Land, 416 ..... C 5
Delavan, 1,248 ..... C 4
Depue, 2,163 ..... B 4
De Soto, 646 ..... F 4
Des Plaines, 14,994 ..... A 6, E 2
Dewey Park,* 1,589 ..... E 4
Diamond Lake, 400 ..... E 2
Dieterich, 500 ..... D 5
Divernon, 1,013 ..... D 4
Dix, 340 ..... E 5
Dixmoor,* 1,327 ..... B 6
Dixon, 11,523 ..... oB 4
Dolton, 5,558 ..... F 3
Dongola, 704 ..... F 4
Dowell, 616 ..... F 4
Downers Grove, 11,886 ..... F 2
Dundee, 3,137 ..... A 5, E 2
Dunes Park,* 1,762 ..... A 6
Dunlap, 500 ..... C 4
Dupo, 2,239 ..... E 3
Du Quoin, 7,147 ..... E 4
Durand, 679 ..... A 4
Dwight, 2,843 ..... B 5
Earlville, 1,217 ..... B 5
East Alton, 7,290 ..... E 3
East Chicago Heights,* 1,548 ..... B 6
East Dubuque, 1,697 ..... A 3
East Dundee,* 9,466 ..... B 5
East Galesburg, 605 ..... C 3
East Hazelcrest,* 1,066 ..... B 6
East Moline, 13,913 ..... B 3
Easton, 371 ..... C 4
East Peoria, 8,698 ..... C 4
East St. Louis, 82,295 ..... E 3
Edgewood, 515 ..... E 5
Edinburg, 921 ..... D 4
Edwardsville, 8,776 ..... oE 4
Effingham, 6,892 ..... oD 5
Elburn, 792 ..... B 5
Eldorado, 4,500 ..... F 5
Elgin, 44 223 ..... A 5, E 2
Elizabeth, 723 ..... A 3
Elizabethtown, 583 ..... oF 5
Elkhart, 420 ..... C 4
Elkville, 934 ..... F 4
Elmhurst, 21,273 ..... B 6, F 2
Elmwood, 1,613 ..... C 4
Elmwood Park, 18,801 ..... F 2
El Paso, 1,818 ..... C 4
Emden, 406 ..... C 4
Enfield, 906 ..... E 5
Equality, 830 ..... F 5
Erie, 1,180 ..... B 3
Esmond, 350 ..... A 5
Eureka, 2,367 ..... oC 4
Evanston, 73,641 ..... A 6 E 3
Evansville, 821 ..... E 4
Evergreen Park, 10,531 ..... F 3
Fairbury, 2,433 ..... C 5
Fairfield, 5 576 ..... oE 5
Fairmont City,* 2,284 ..... E 4
Fairmount, 618 ..... C 6
Fairview, 568 ..... C 3
Fairview,* 1,524 ..... E 4
Farina, 787 ..... E 5
Farmer City, 1,752 ..... C 5
Farmersville, 485 ..... D 4
Farmington, 2,651 ..... C 3
Fillmore, 384 ..... D 4
Findlay, 680 ..... D 5
Fisher, 894 ..... C 5
Fithian, 414 ..... C 6
Flanagan, 672 ..... C 5
Flat Rock, 558 ..... E 6
Flora, 5,255 ..... E 5
Flossmoor, 1,804 ..... F 3
Forest Park, 14,969 ..... F 2
Forest Park,* 3,117 ..... B 6
Forrest, 1,040 ..... C 5
Forreston, 1,048 ..... A 4
Fort Sheridan, 2,600 ..... A 6, E 2
Fox Lake, 2,238 ..... A 5, E 2
Fox River Grove, 1,313 ..... E 2
Fox River Heights,* 1,083 ..... B 5
Frankfort, 685 ..... F 2
Franklin, 438 ..... D 3
Franklin Grove, 741 ..... B 4
Franklin Park, 8,899 ..... E 2
Freeburg, 1,661 ..... E 4
Freeport, 22,467 ..... oA 4
Fulton, 2,706 ..... B 3
Galatia, 933 ..... F 5
Galena, 4,648 ..... oA 3
Galesburg, 31,425 ..... oC 3
Galva, 2,886 ..... B 3
Gardena, 500 ..... C 4
Gardner, 981 ..... B 5
Geneseo, 4,325 ..... B 3
Geneva, 5,139 ..... oB 5, F 1
Genoa, 1,690 ..... A 5
Georgetown, 3,294 ..... D 6
Germantown, 811 ..... E 4
Gibson City, 3,029 ..... C 5
Gifford, 359 ..... C 5
Gillespie, 4,105 ..... D 4
Gilman, 1,602 ..... C 5
Girard, 1,740 ..... D 4
Gladstone, 340 ..... C 3
Glasford, 922 ..... C 4
Glen Carbon, 1,176 ..... E 4
Glencoe, 6,980 ..... A
Glen Ellyn, 9,524 ..... B 5
Glenview, 6,142 ..... A 6
Godfrey, 1,438 ..... E 4
Golconda, 1,066 ..... F 5
Golden, 512 ..... D 4
Good Hope, 392 ..... C 4
Goreville, 581 ..... F 5
Gorham, 447 ..... F 4
Grafton, 1,117 ..... E 4
Grand Tower, 963 ..... F 5
Grand Ridge, 530 ..... C 5
Grandview, 1,349 ..... E 4
Granite City, 29,465 ..... E 4
Grant Park, 564 ..... B 5
Granville, 978 ..... C 4
Grayslake, 1,970 ..... A
Grayville, 2,461 ..... F 5
Greenfield, 987 ..... D 3
Greenup, 1,360 ..... E 5
Green Valley, 503 ..... C 4
Greenview, 795 ..... C 5
Greenville, 4,069 ..... E 4
Gridley, 817 ..... C 4
Griggsville, 1,199 ..... C 3
Gurnee, 1,097 ..... A 5
Hamilton, 1,776 ..... B 4
Hammond, 405 ..... E 5
Hampshire, 970 ..... A 5
Hanna City, 671 ..... C 4
Hanover, 1,643 ..... A 3
Hardin, 928 ..... E 4
Harrisburg, 10,999 ..... F 5
Hartford, 1,909 ..... E 4
Harvard, 3,464 ..... A 5
Harvey, 20,683 ..... B
Havana, 4,379 ..... C 3
Hazel Crest, 2,129 ..... F 3
Hebron, 696 ..... A 5
Hennepin, 312 ..... D 5
Henry, 1,966 ..... C 3
Herrick, 554 ..... E 5
Herrin, 9,331 ..... F 5
Herscher, 515 ..... B 6
Heyworth, 1,072 ..... C 5
Highland, 4,283 ..... E 4
Highland Park, 16,808 ..... A
Highwood, 3,813 ..... A
Hillsboro, 4,141 ..... D 4
Hillsdale, 400 ..... B 4
Hillside,* 2,131 ..... B 6
Hillview, 419 ..... C 3
Hinckley, 774 ..... B 5
Hindsboro, 377 ..... D 5
Hinsdale, 8,676 ..... B 5
Homer, 1,030 ..... C 5
Homewood, 5,887 ..... B
Hoopeston, 5,992 ..... C 6
Hopedale, 574 ..... C 5
Hoyleton, 462 ..... E 5
Hull, 489 ..... C 3
Hume, 448 ..... D 5
Huntley, 830 ..... A 5
Hurst, 858 ..... F 5
Hutsonville, 647 ..... E 6
Idylside,* 1,172 ..... B 6
Illiopolis, 833 ..... D 5
Ina, 432 ..... E 5
Indianola, 392 ..... D 6
Industry, 496 ..... B 4
Ingalls Park,* 6,840 ..... B 6
Inverness,* 1,110 ..... B 6
Ipava, 667 ..... C 3
Irving, 539 ..... C 5
Irvington, 379 ..... E 5
Itasca, 1,274 ..... B 6
Iuka, 450 ..... E 5
Ivesdale, 407 ..... C 6
Jacksonville, 20,387 ..... C 3
Jerseyville, 5,792 ..... E 4
Johnsburg, 557 ..... A 5
Johnston City, 4,47
Joliet, 51,601 ..... o
Jonesboro, 1,607 ..... F 5
Joppa, 513 ..... F 5
Joy, 505 ..... B 4
Kampsville, 437 ..... C 3
Kane, 485 ..... D 4
Kankakee, 25,856 ..... B 6
Kansas, 835 ..... E 4
Karnak, 792 ..... F 5
Keithsburg, 1,006 ..... C 3
Kenilworth, 2,789 ..... B 6
Kenney, 409 ..... C 5
Kewanee, 16,821 ..... B 3
Keyesport, 438 ..... E 5
Kilbourne, 374 ..... C 3
Kincaid, 1,793 ..... E 4
Kinmundy, 912 ..... E 5
Kirkland, 685 ..... B 3
Kirkwood, 747 ..... C 3
Knox, 650 ..... A 5
Knoxville, 2,209 ..... C 4
Lacon, 2,020 ..... C 5
Ladd, 1,224 ..... C 5
La Grange, 12,002 ..... B 6

o Indicates County Seat.

* Place names marked by an asterisk do not appear on the map. Key shows general location.


Dubuque
Clinton
Davenport
Rock Island
Moline
Muscatine
Galesburg
Monmouth
Peoria
Springfield
Jacksonville
Litchfield
Jerseyville
Alton
Edwardsville
Granite City
St. Louis
University City
Clayton
Belleville
Chicago
Waukegan
Highland Park
Evanston
Oak Park
Cicero
Berwyn
Whiting
E. Chicago
Gary
Hammond
Calumet City
Harvey
Blue Island
Lake Michigan
Mississippi
Illinois
Missouri
Mississippi
Cedar R.
Maquoketa R.
Rock R.
Green R.
Illinois R.
Kaskaskia R.
Ste. Genevieve
Chicago Sag Channel
Calumet R.
Calumet Lake
Wolf Lake
Lake Calumet
Lake Michigan
91°
90°
42°
30'
39°
87°
30'
38°
41°
30'
© RMcN&Co.

COSMO RELIEF
Copyright by
RAND McNALLY &
Made in U.S.A.
87°
88°
6
5
4
Lake
Michigan
Chicago
Waukegan
North Chicago
Lake Bluff
Lake Forest
Highland Park
Glencoe
Winnetka
Wilmette
Evanston
Winthrop Harbor
Zion
Antioch
Fox Lake
Grayslake
Libertyville
Mundelein
Crystal Lake
Cary
Barrington
Palatine
Deerfield
Mt. Prospect
Highwood
Fort Sheridan
Hammond
Harvey
Calumet City
Blue Island
Joliet
Morris
Ottawa
Streator
Pontiac
Kankakee
Watseka
Danville
Champaign
Urbana
Mahomet
Tuscola
Arcola
Hindsboro
Newman
Paris
Terre Haute
Vermilion
Clinton
Decatur
Macon
Dalton City
Moweaqua
Bethany
Sullivan
Humboldt
Mattoon
Charleston
Westfield
Marshall
Martinsville
Shelbyville
Strasburg
Neoga
Cumberland
Casey
Greenup
Farmersburg
Shelburn
Effingham
Altamont
Dieterich
Watson
Teutopolis
Beecher City
Newton
Ste. Marie
Flat Rock
Robinson
Sullivan
Bicknell
Vincennes
Olney
Noble
Calhoun
Parkersburg
Flora
Clay City
Xenia
Salem
Centralia
Mount Vernon
Fairfield
Sims
Wayne City
Goldengate
Albion
Keenes
Princeton
Owensville
Ft. Branch
Grayville
Springerton
Mill Shoals
Belle Rive
Waltonville
Bonnie
Dahlgren
Thackeray
Enfield
Crossville
New Harmony
Evansville
Mount Vernon
Henderson
Uniontown
Morganfield
Sebree
Sturgis
Dixon
Clay
Cave in Rock
Providence
Earlington
Madisonville
Rosiclare
Golconda
Dixon Springs
Eddyville
Elizabethtown
Goreville
Simpson
Vienna
Reevesville
Pelknap
Creal Springs
Stonefort
New Burnside
Benton
Frankfort
Johnston City
Harrisburg
Marion
Herrin
Pittsburg
Eldorado
Galatia
Omaha
Equality
Ridgway
Shawneetown
Junction
Carriers Mills
Ledford
Muddy
Norris City
New Haven
Dale
Broughton
Leansboro
Mt. Carmel
Albion
Bicknell
Vincennes
Lawrenceville
Princeton
Owensville
Ft. Branch
Wabash R.
White R.
Patoka R.
Skillet Fk.
Saline R.
Ohio R.
Green R.
Pond R.
Cumberland R.
Kaskaskia R.
Embarras R.
Little Wabash R.
Big Muddy R.
Kankakee R.
Iroquois R.
Vermilion R.
Mississippi R.
Illinois R.
Fox R.
Des Plaines R.
Calumet R.
Sangamon R.
Mackinaw R.
Kickapoo Cr.
Sugar Cr.
Sandy Cr.
Big Muddy R.
Crab Orchard L.
Cache R.
Big Bay Cr.
Big Creek
Big Muddy R.
Kaskaskia R.
Embarras R.
Little Wabash R.
Wabash


ILLINOIS
1 Inch = 31.5 Statute Miles
Miles 5 0 5 10 15 20 25
State Capital
County Seat
Size of symbols and type indicates relative population
Lambert Conformal Projection
RELIEF
Feet
5 000
2 000
1 000
500
100
Sea Level
Below Sea Level
500
5 000
COSMO RELIEF ILLINOIS
Copyright by RAND McNALLY & COMPANY
Made in U. S. A.
CHARLES MOUND 1,241 FT. HIGHEST PT. IN ILL.
Chicago
Lake Michigan
Michigan City
Hammond
Gary
Waukegan
North Chicago
Lake Forest
Highland Park
Glencoe
Winnetka
Wilmette
Evanston
Elgin
Des Plaines
Arlington Heights
Aurora
Joliet
Naperville
Rockford
Freeport
Dubuque
Davenport
Rock Island
Moline
Galesburg
Peoria
Bloomington
Normal
Springfield
Decatur
Champaign
Urbana
Danville
Quincy
Keokuk
Burlington
Clinton
Sterling
Dixon
Kankakee
Streator
Pontiac
Ottawa
Joliet
Beloit
Janesville
Madison
Milwaukee
Racine
Kenosha
Gulf of Mexico
Mississippi
Ohio
Missouri
Illinois
Wabash
Cumberland
Tennessee
Kentucky
Evansville
Paducah
Cairo
Terre Haute
Vincennes
Mt. Vernon
Carbondale
Marion
Harrisburg
Alton
St. Louis
Belleville
Kaskaskia
Cahokia
Fort Chartres
Fort Kaskaskia
Fort Massac
Fort Sheridan
Fort Dearborn
Fort Pontiac
Fort Clark
Fort Ouiatenon
Fort Vincennes
Fort Sackville

Population 8,712,176

○C 4	Shawneetown, 1,917 ○F 5
425 C 4	Sheffield, 995 B 4
B 6	Shelbyville, 4,462 ○D 5
E 4	Sheldon, 1,114 C 6
D 3	Sheridan, 476 B 5
B 4	Sherrard, 484 B 3
D 5	Shipman, 376 D 3
○C 4	Sibley, 345 C 5
D 5	Sidell, 554 D 6
F 3	Sidney, 653 C 5
E 4	Silvis, 3,055 B 3
99 ○E 4	Sims, 408 E 5
E 6	Skokie, 14,832 E 3
C 5	Smithfield, 355 C 3
F 5	Smithton, 515 E 4
○D 3	Somonauk, 721 B 5
B 5, F 2	Sorento, 692 E 4
B 5	South Beloit, 3,221 A 4
D 3	South Chicago Heights, 2,129 F 3
500 D 4	South Elgin, 1,220 E 2
C 3	South Holland,* 3,247 B 6
E 4	South Jacksonville, 1,165 D 3
B 4	South Lockport-Fairmont,* 3,291 B 6
○C 5	South Park,* 2,063 B 5
A 5	South Pekin, 1,043 C 4
B 3	South Streator,* 1,508 C 5
F 3	South Waukegan,* 2,830 A 6
C 6	South Wilmington, 662 B 5
C 4	Sparland, 509 B 4
691 B 4	Sparta, 3,576 E 4
F 4	Springfield, 81,628 ○D 4
○D 2	Spring Valley, 4,916 B 4
D 4	Stanford, 457 C 4
C 6	Staunton, 4,047 D 4
B 5	Steeleville, 1,353 E 4
C 5	Steger, 4,358 B 6, F 3
D 4	Sterling, 12,817 B 4
E 4	Stewardson, 666 D 5
B 3	Stickney,* 3,317 B 6
A 5, D 1	Stillman Valley, 362 A 4
E 4	Stockton, 1,445 A 3
D 6	Stonefort, 490 F 5
36 B 6	Stone Park,* 1,414 B 6
F 5	Stonington, 1,120 D 4
F 3	Strasburg, 436 D 5
823 F 2	Streator, 16,469 B 5
39 E 2	Stronghurst, 741 C 3
F 2	Sullivan, 3,470 ○D 5
D 4	Summit, 8,957 F 2
C 4	Sumner, 1,170 E 6
F 3	Swansea,* 1,816 E 4
C 5	Swissville,* 1,009 B 4
○D 6	Sycamore, 5,912 ○B 5
B 4	Table Grove, 481 C 3
D 4	Tallula, 527 D 4
B 5, F 2	Tamaroa, 849 E 4
on,*	Tamms, 665 F 4
B 6	Tampico, 760 B 4
3 B 4	Taylor Springs, 627 D 4
○A 4	Taylorville, 9,188 ○D 4
710 ○B 3	Techny, 600 E 2
A 4	Teutopolis, 919 D 5
E 2	Thayer, 695 D 4
8 D 3	Thebes, 541 F 4
A 4	Thomson, 559 B 3
E 2	Thornton,* 1,217 B 6
C 3	Tilden, 906 E 4
ts,*	Tilton, 1,638 C 6
E 4	Tinley Park, 2,326 F 2
E 5	Tiskilwa, 962 B 4
C 6	Toledo, 905 ○D 5
3 E 2	Tolono, 1,065 D 5
ach,*	Toluca, 1,419 B 4
A 6	Tonica, 585 B 4
k,*	Toulon, 1,173 ○B 4
A 6	Tovey, 803 D 4
E 4	Towanda, 400 C 5
F 4	Tower Hill, 784 D 5
○C 3	Tremont, 1,138 C 4
C 4	Trenton, 1,432 E 4
D 5	Troy, 1,260 E 4
B 6	Tuscola, 2,960 ○D 5
09.B 5, F 1	
C 3	
D 5	
1,117 E 6	
E 4	
C 5	
E 5	
○E 5	
E 4	
7 B 5	
C 4	
A 3	
C 5	
385 A 3	
384 E 2	
93 D 4	
erville,*	
B 5	
C 4	
B 5	
E 4	
B 5	
A 4	

Ullin, 773	
Union, 435	F 4
Urbana, 22,834	A 5
Utica, 1,019	○C 5
Valier, 808	B 4
Valmeyer, 656	E 4
Vandalia, 5,471	E 3
Venice, 6,226	○E 4
Vermont, 940	E 3
Versailles, 472	C 3
Victoria, 469	D 3
Vienna, 1,085	B 3
Villa Grove, 2,026	○F 5
Villa Park, 8,821	D 5
Villa Ridge, 550	F 2
Viola, 826	F 4
Virden, 3,206	B 3
Virginia, 1,572	D 4
Walnut, 1,093	○D 3
Waltonville, 459	B 4
Wamac, 1,429	E 4
Wapella, 504	E 4
Warren, 1,378	C 5
Warrensburg, 549	A 4
Warrenville, 1,891	D 4
Warsaw, 2,002	F 2
Washburn, 999	C 2
Washington, 4,285	C 4
Washington Park, 5,840	C 4
Wataga, 550	E 3
Waterloo, 2,821	B 3
Waterman, 750	○E 3
Watseka, 4,235	B 5
Wauconda, 1,173	○E 6
Waukegan, 38,946	E 2
Waverly, 1,330	○A 6, E 2
Wayne City, 726	D 4
Waynesville, 516	E 5
Wenona,* 1,005	C 4
Westchester,* 4,308	B 4
West Chicago, 3,973	B 6
West City, 1,081	F 2
West Dundee,* 1,948	E 5
Western Springs, 6,364	B 5
Westfield, 661	F 2
West Frankfort, 11,384	D 6
West Kankakee, 2,784	F 5
Westmont, 3,402	B 6
West Salem, 902	F 2
West Sterling,* 1,531	E 5
West Union, 650	B 3
Westville, 3,196	D 6
Wheaton, 11,638	C 6
Wheeling, 916	○B 5, F 2
White Hall, 3,082	E 2
Williamsfield, 542	D 3
Williamsville, 656	C 3
Willisville, 635	D 4
Willow Springs, 1,314	F 4
Wilmette, 18,162	F 2
Wilmington, 3,354	A 6, E 3
Wilsonville, 822	B 5
Winchester, 1,591	D 4
Windsor, 1,008	○D 3
Winnebago, 752	D 5
Winnetka, 12,105	A 4
Winslow, 355	A 6, E 3
Winthrop Harbor, 1,765	A 4
Witt, 1,156	A 6, D 2
Wonder Lake,* 1,072	D 4
Wood Dale, 1,857	A 5
Woodhull, 718	E 2
Wood River, 10,190	B 3
Woodstock, 7,192	E 3
Worden, 968	○A 5
Worth,* 1,472	E 4
Wyanet, 950	B 6
Wyoming, 1,496	B 4
Xenia, 643	B 5
Yates City, 623	C 3
Yorkville, 632	○B 5
Zeigler, 2,516	F 4
Zion, 8,950	A 6, D 2

Physical Features

Big Muddy R	F 4
Cache R	F 4
Calumet, Lake	F 3
Calumet Sag Channel	F 2
Charles Mound (Highest Point in Illinois)	A 3
Chicago Sanitary and Ship Canal	F 2
Crab Orchard Lake	F 5
Decatur, Lake	D 5
Des Plaines R	B 5
Du Page R	F 2
Embarrass R	E 6
Fox Lake	A 5
Fox R	B 5
Green R	B 4
Illinois and Mississippi Canal	B 3
Illinois R	B 5
Kankakee R	B 5
Kaskaskia R	D 5
La Moine R	C 3
Lincoln Tomb	D 4
Little Wabash R	E 5
Mackinaw R	C 4
Macoupin Creek	D 3
Michigan, Lake	A 6
Mississippi R	A 3
Ohio R	F 5
Rock Creek	B 4
Rock R	B 4
Saline R	F 5
Sangamon R	C 3
Skillet Fork	E 5
Spoon R	C 3
Springfield, Lake	D 4
Tennessee R	F 5
Vermilion R	B 5
Wabash R	E 6
Wolf Lake	F 3

7 on the map. Key shows general location.

especially in winter. This is because there are no mountain ranges to interfere with warm breezes coming up the Mississippi Valley or cold winds from the north.

Rainfall is heaviest during spring and summer. It is well distributed throughout the state. Most of the rain is carried by winds blowing north from the Gulf of Mexico. The southern section of the state gets most of this rain. It averages about eight inches of rain a year more than the northern section. Snow falls throughout Illinois during the winter. But the snow is usually about twice as heavy in the north as in the south. In southern Illinois the winds are usually from the south or the southwest. The winds which sweep the northern part of the state are chiefly from the north or northwest in winter, and from the southwest in summer.

Natural Resources. A layer of rich soil was spread over Illinois as the glaciers melted. This soil was made even richer by the decaying of prairie grass for hundreds of years before the first settlers came to the Illinois country. This layer of soil ranges from two feet to one hundred feet in depth. Beneath it are rich deposits of coal, petroleum, and other minerals. Most of the forests which covered the valleys and hills have been cut down. But there remain about one hundred different kinds of trees in various parts of the state.

Large quantities of fish are taken from Lake Michigan, from the smaller lakes of the state, and from the many rivers and streams. The most valuable fish caught are perch, bass, pike, catfish, carp, sunfish, and buffalo fish. Fur-bearing animals which roam the state forest preserves include skunk, muskrat, raccoon, opossum, squirrel, and rabbit. It is said that more wild ducks use the Illinois River Valley as a resting place and feeding ground than any other place in the world. Other game birds found in the state include quail, pheasant, and wild goose.

Conservation and Development. In 1860, Judge J. D. Caton created a game preserve at Ottawa and stocked it with animals and fish. This is believed to be the first game preserve established in the United States. Today, conservation of fish, wildlife, and forestry is the responsibility of the Department of Conservation. The department was created in 1927 and enlarged in 1951 to include the Division of Parks and Memorials. Approximately 100,000 acres of land are maintained for recreation and conservation demonstration purposes. The reforestation of submarginal lands in southern Illinois was a program to restore this great outdoor recreational territory. Migratory waterfowl are abundant during the fall and early winter on their migration south, and thousands of Canadian geese gather in southern Illinois each year.

The conservation of minerals is the responsibility of the Department of Mines and Minerals. The Department of Oil and Gas has charge of oil and gas.

Flood-control measures include the construction of large levees, or high banks of earth, along the Mississippi and Ohio rivers, to protect the lowlands of the state from the raging floodwaters.

The People and Their Work

Population: 8,712,176 (1950), ranking fourth among the states. *Density*, 154.5 persons per square mile, ranking tenth. *Distribution*, urban, 77.6 per cent; rural, 22.4

y in winter. This is because there are no moun-
ges to interfere with warm breezes coming up
ssippi Valley or cold winds from the north.
ll is heaviest during spring and summer. It is
ibuted throughout the state. Most of the rain
by winds blowing north from the Gulf of Mexi-
southern section of the state gets most of this
verages about eight inches of rain a year more
northern section. Snow falls throughout Illinois
e winter. But the snow is usually about twice as
the north as in the south. In southern Illinois
s are usually from the south or the southwest.
ds which sweep the northern part of the state
y from the north or northwest in winter, and
southwest in summer.

l Resources. A layer of rich soil was spread over
s the glaciers melted. This soil was made even
the decaying of prairie grass for hundreds of
ore the first settlers came to the Illinois country.
r of soil ranges from two feet to one hundred
pth. Beneath it are rich deposits of coal, petro-
d other minerals. Most of the forests which
he valleys and hills have been cut down. But
ain about one hundred different kinds of trees
s parts of the state.

quantities of fish are taken from Lake Michi-
n the smaller lakes of the state, and from the
vers and streams. The most valuable fish
e perch, bass, pike, catfish, carp, sunfish, and
sh. Fur-bearing animals which roam the state
serves include skunk, muskrat, raccoon, opos-
rrel, and rabbit. It is said that more wild ducks
linois River Valley as a resting place and feed-
d than any other place in the world. Other
ds found in the state include quail, pheasant,
goose.

vation and Development. In 1860, Judge J.
created a game preserve at Ottawa and stocked
imals and fish. This is believed to be the first
serve established in the United States. To-
ervation of fish, wildlife, and forestry is the
ility of the Department of Conservation. The
nt was created in 1927 and enlarged in 1951
e the Division of Parks and Memorials. Ap-
ely 100,000 acres of land are maintained for
and conservation demonstration purposes.
estation of submarginal lands in southern Illi-
a program to restore this great outdoor recrea-
itory. Migratory waterfowl are abundant dur-
ll and early winter on their migration south,
sands of Canadian geese gather in southern
ch year.

nservation of minerals is the responsibility of
rtment of Mines and Minerals. The Depart-
il and Gas has charge of oil and gas.

ontrol measures include the construction of
es, or high banks of earth, along the Mississippi
rivers, to protect the lowlands of the state
raging floodwaters.

The People and Their Work

on: 8,712,176 (1950), ranking fourth among
Density, 154.5 persons per square mile, rank-
Distribution, urban, 77.6 per cent; rural, 22.4
per cent. *Largest cities*, Chicago (3,620,962), Peoria (111,856), Rockford (92,927), East St. Louis (82,295), Springfield (81,628). For population of other cities, see back of colored map.

Chief Products: *Manufactured*, machinery (especially electrical and agricultural), steel and steel products (including railway cars), printing and publishing, meat-packing products, furniture, candy, petroleum-refinery products, chemicals, leather, soap, fertilizers, bricks and other clay products, textiles, clothing, glass, watches and clocks, Portland cement, corn products, brewery and distillery products, stoves, flour, livestock feeds, coke, musical instruments, radios, television sets, and phonographs, canned and dried foodstuffs, electrical equipment. *Agricultural*, corn, hogs and pork, dairy products, cattle and calves, oats, wheat, hay and hayseed, soybeans, cowpeas, broomcorn, potatoes, barley, rye, poultry and eggs, fruits (especially apples, peaches, and pears), vegetables, horses and mules, bees and honey. *Mineral*, coal, petroleum and natural gas, limestone, sand and gravel, sandstone, cement, tile and brick clay, fluorite, tripoli, fuller's earth.

The People. Only a few hundred white people lived in the Illinois country before the Revolutionary War. They were French explorers, missionaries, fur traders, and a few English farmers. After the war many soldiers who had helped George Rogers Clark conquer the territory came back as settlers. Their stories of the fertile land attracted others from the East. Most of these new settlers came from Kentucky and Virginia. Some were from Pennsylvania, Maryland, and North Carolina. Most of the pioneers chose homesites along the Ohio, Wabash, Mississippi, and Kaskaskia rivers. These river valleys had plenty of timber for building cabins and fences. The soil of the valleys also was believed to be more fertile than that of the plains. Another reason these settlers chose river locations was that goods could be shipped to and from the settlements by water.

Only the southern third of the state was settled when Illinois was admitted to the Union in 1818. The northern part of the state did not begin to be occupied until 1825, when the Erie Canal was opened. Then families from New York and New England settled in the north. Between 1820 and 1840, large numbers of miners came to work in the lead mines around Galena. After 1836 many Irish came to help build the Illinois and Michigan Canal. Later, other immigrants came from all parts of Europe. They helped build the railroads, took farms on the prairies, or worked in the mines.

After 1865 the growing industries of the state attracted European immigrants to the factories, mills, and forges of such northern cities as Chicago, Joliet, and Rockford. In Chicago many groups of foreigners established colonies within the city and kept many of their Old World ways of life. By 1914, Germans made up about one fourth of the total population.

About 87 per cent of the present population of Illinois is composed of American-born whites. Poles and Germans are the most numerous of the foreign-born. Other foreign groups include the Italians, Swedes, Russians, Czechoslovaks, Lithuanians, Irish, English, Austrians, and Canadians. There are about 400,000 Negroes in the state. Most of them live in Chicago and the other large cities. There are about 2,500 Chinese, most of whom live in Chicago. Only about 600 Indians remain of the thousands who once roamed the Illinois prairies.

Three of every four persons in Illinois live in cities or towns. Over 40 per cent of the population of the state live in Chicago. By 1950, the nation's center of population had moved westward from Indiana to a point in Richland County, eight miles northwest of Olney, Ill.

Manufactures. Less than a hundred years ago, nearly all the people of Illinois were farmers. Today, three persons work in some form of manufacturing industry for every person who is a farmer. About three fourths of the manufactured products of Illinois are made in Chicago. This city ranks second only to New York City among the industrial cities of the United States.

One fourth of all the meat animals in the United States are slaughtered in the livestock yards of Illinois. Most of the large meat-packing establishments of the country are located in Chicago, East St. Louis, and Peoria. Important by-products include fertilizer, glue, brushes, soap, buttons, leather, and gelatin.

Illinois ranks high among the states in the manufacture of iron and steel, and of products made from these metals. Iron ore can be transported from the mines along Lake Superior easily and cheaply over inland waterways to Illinois steel-making centers. Illinois has coal, limestone, and fluorite, used in making iron and steel, within its own borders. Great steel and rolling mills, blast furnaces, and foundries are located at Chicago, East St. Louis, Granite City, and Joliet.

Illinois has made and sold farm machinery and tools throughout the Middle West farming area for more than fifty years. Moline became known as the "Plow City" after John Deere began to make farm machines there in 1848. Today there are large farm-machinery plants in Chicago, Moline, Rock Island, Canton, Rockford, and Peoria. Peoria is famous for caterpillar tractors. Road-building machinery is made at Aurora. Road-making and heavy machinery and farm implements are made at Springfield. Kewanee is noted for making steam boilers for industrial heating and power plants. Railway locomotives, freight and passenger cars, and other railroad equipment are made in Chicago. Railway repair shops are in Chicago, Decatur, Savanna, Aurora, Galesburg, and Clinton.

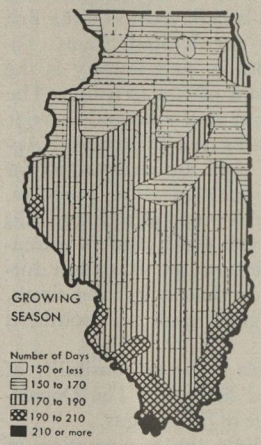
Rockford is one of the chief furniture-manufacturing cities of the United States. Elgin is famous for the manufacture of watches. Clocks are made at Peru and La Salle. Several large distilleries are located in Peoria. Chicago and Decatur are centers for the manufacture of corn products, especially cornstarch and corn syrup. The largest glass-bottle factory in the world is located at Alton. Other large glassmaking cities are Chicago and East St. Louis. The refining of petroleum is an important industry in Chicago, Alton, and East St. Louis. Chicago has large plants which make electrical machinery and appliances, telephone equipment, and clothing. The largest mail-order houses in the United States are located in Chicago. These firms mail goods of various kinds to rural areas throughout the nation, and even to foreign countries. Chicago also is the second largest printing and publishing center of the nation.

Other important products which are produced throughout Illinois include butter and cheese; drugs and medicines; rope, cord, and twine; bricks and other clay products; lumber and wood products; pianos and other musical instruments; paints and varnishes; and shoes, belting for power machinery, and other leather goods.

Agriculture. Illinois has many advantages as a farming state. It has fertile soil, a climate favorable to farming, and a surface that is flat and easily cultivated. The many large cities and towns make excellent markets for farm products. Illinois farmers have been leaders in the use of farm machinery, which has helped them produce larger crops. There are many farm co-operative associations which help the farmers to buy and sell to their best advantage. In many parts of the state there are grain elevators, creameries, and stores which are co-operatively owned and managed.

Corn and Other Field Crops. Corn has been the chief crop of Illinois farmers from pioneer days. Two of every five acres of Illinois farm land are planted in corn. This grain grows best in the central part of the state, where the average yield is unusually high. Most of the corn is sold as grain, but a large part of it is used in factories for making a wide variety of corn products. Oats are grown in the central and northeast sections of the state. Illinois was the largest wheat-producing state during the middle 1800's. Now the wheat crop is less important, and a number of other states grow more of this grain than Illinois. But millions of bushels of wheat still are raised, particularly in the south and west-central sections of Illinois. Other important grain crops of the state include barley, rye, popcorn, and buckwheat. Soybeans have become an important field crop in recent years.

Illinois raises more than 40 per cent of all the soybeans produced in the United States. This is more than twice as much as the soybean production of any other state. Soybeans grow especially well in the southern part of Illinois. Here the soil is too acid to raise clover or alfalfa, but is ideal for soybeans. Much broomcorn is grown in Cole County. The brush or fiber of this corn is made into brooms. Paris, Ill., has one of the largest broom factories in the world. In the warm river bottom lands of southern Illinois, cowpeas and potatoes are among the principal crops.



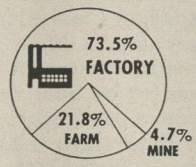
Illinois is one of the leading states in the growing of hay, alfalfa, and clover. The chief varieties of hay grown are timothy, clover, and redtop. Most of the redtop seed supply of the United States comes from southeastern Illinois.

Fruits and Vegetables. Calhoun, Adams, Pike, Greene, and Jersey counties are noted for the large apple crops gathered from their orchards each year. Other counties in which large apple crops are grown include Clay, Crawford, Cumberland, Effingham, Jasper, Johnson, Marion, Randolph, Richland, and Union. Many peaches are also produced in Union and Marion counties. Other fruits raised in large quantities include pears, plums, cherries, grapes, and strawberries. Melons grow well in the valleys of the Wabash and Mississippi

ILLINOIS

LEADING PRODUCTS AND INDUSTRIES

SOME PRODUCTS ARE OF STATE–WIDE IMPORTANCE
THE SYMBOLS ON THE MAP INDICATE LEADING AREAS ONLY



AVERAGE YEARLY VALUE OF LEADING PRODUCTS

EACH DISK REPRESENTS 50 MILLION DOLLARS
DISKS REPRESENTING FACTORY PRODUCTS
INDICATE VALUE ADDED TO MATERIALS IN THE FACTORY

FARM

CORN	●●●●● ●●●●● ●●●●●
HOGS AND PORK	●●●●● ●●●●● ◔
CATTLE, CALVES	●●●●● ◐
SOYBEANS	●●●●◐
DAIRY PRODUCTS	●●●●
OATS	●●●◔

MINE

COAL	●●●●◔
PETROLEUM	●●◔

FACTORY (PLANTS AND MILLS)

INDUSTRIAL MACHINERY	●●●●● ●●●●● ●●●●● ●◔
ELECTRICAL MACHINERY	●●●●● ●●●●● ●●●◐
PRINTING AND PUBLISHING	●●●●● ●●●
AGRICULTURAL MACHINERY	●●●●● ◔
CLOTHING	●●●●●
STEEL WORKS	●●●●
MEAT PRODUCTS	●●●◔
STONE AND GLASS	●●●◐

IOWA

MISSOURI

ROCKFORD

PEORIA

SPRINGFIELD

EAST ST. LOUIS

CHICAG

KEN

ILLINOIS RIVER

MISSISSIPPI RIVER

LAND USE

CROPS	PASTURE
56%	17%

Based on latest U.S. Government statistics; prepared for the e
WORLD BOOK ENCYCLOPEDIA by Pictograph Corpo

rivers. Most of the vegetables grown in the state come from the south or from the lake region of the northeast. Illinois is among the leading states in the growing of sweet corn and tomatoes for canning.

Livestock and Poultry. Nearly two thirds of the farm income of Illinois comes from the sale of livestock and poultry. Millions of hogs, beef cattle, sheep, and lambs are sent to the stockyards to be slaughtered every year. Some of the beef cattle are brought from the ranges of the West to be fattened in Illinois pastures before they are slaughtered.

The dairy and poultry farms of Illinois are so productive that they have helped to make Chicago the largest butter and egg market in the world.

Many horses and mules are raised on stock farms in Illinois. East St. Louis has one of the largest mule markets in the United States.

Minerals. Coal was first discovered in North America along the Illinois River. It has been mined in Illinois for more than a hundred years. Today coal is the most valuable of Illinois minerals. It is mined in about 50 of the 102 counties of the state. Most of the coal production is in the south, where the veins are the richest. Illinois is one of the nation's leading coal-producing states. The coal deposits lie under about two thirds of the area of the state. Large quantities of peat are also found in Illinois, chiefly in the swamps and lake regions of the northeast.

Illinois ranks among the leading states in the production of oil. The pumping of oil began in Clark County in 1906. The production of petroleum and gasoline increased after new oil fields were discovered in the Clark County region in 1937.

Large quantities of tile, brick clay, and gravel are found in various parts of Illinois. Some of the largest deposits of silica sand in the world are found near Ottawa. This sand is used in the making of glass. An abrasive stone called *tripoli* is mined in large quantities in Alexandria and Union counties. Fluorite is mined in the southern part of the state, especially in Hardin and Pope counties. Fuller's earth is found in Pulaski County. There are valuable limestone, sandstone, and granite quarries in various parts of Illinois.

In the early 1800's, large quantities of lead and zinc were mined in Jo Daviess County. Galena, in the center of the mining district, was then a larger and more important city than Chicago. The lead and zinc mines of this district are still producing. Small quantities of lead are produced in southern Illinois as a by-product of fluorite mining.

Transportation. The rivers were the chief travel routes in the early days of the Illinois country. Later, canals were built for water traffic. The Illinois and Michigan Canal was completed in 1848. It ran from Chicago's Lake Michigan waterfront to Ottawa, Ill. There it connected with the Illinois River, a tributary of the Mississippi. The Chicago Sanitary and Ship Canal was completed in 1900. It connected Lake Michigan with the Mississippi by way of the Chicago, Desplaines, and Illinois rivers. In 1933 the Chicago Sanitary and Ship Canal was made part of the Illinois Waterway, which was a link in the Lakes-to-Gulf Waterway. (See LAKES-TO-GULF WATERWAY.) A series of locks and dams now makes it possible for boats and barges to travel from Chicago to New Orleans. The large tonnage of traffic on the Illinois Waterway increases every year.

Most of the present water traffic of Illinois is on Lake Michigan. Chicago is one of the great lake ports of the world. The city is visited by many large freighters from other cities of the United States and from Canada. Passenger boats travel regularly between Chicago, Milwaukee, and the lake ports of Michigan. Other boats provide longer cruises over the entire Great Lakes system and into Canada.

The first land travel in the Illinois country was over the buffalo and Indian trails which ran through the high prairie grass. The Portage Trail connected the Chicago and Illinois rivers. The Great Sauk Trail ran from the Fox and Sauk Indian villages near the site of Rock Island, around the edge of Lake Michigan, and on north into Canada. The Vincennes Trail connected Vincennes, Ind., with Cahokia, Ill. The first road to be built by white men in the Illinois country was constructed by the French in the 1750's. This road connected Cahokia with Kaskaskia. During the early 1800's the historic National Road, or Cumberland Road, was extended west as far as Vandalia. Many roads built of planks, called *corduroy roads*, were laid in the 1840's. In 1914 paved roads began to be built throughout the state. Now Illinois has more paved highways than any other midwestern state. These roads, most of which are maintained by the State Highway Department, cover about twelve thousand miles.

The first Illinois railroad was the state-owned Northern Cross Railroad. This began to operate in 1839 between Jacksonville and Meredosia, a distance of only about twenty-four miles. A railroad-building boom occurred in the state in the 1850's. In 1856 the Illinois Central completed a line from Cairo to Chicago and from Centralia to Dunleith (now East Dubuque). Nearly 700 miles long, it was then the longest railroad in America. The building of railroads in Illinois was an easy matter, for the land was level and few bridges or tunnels were necessary. It was not long before a network of rail lines covered the state. Now Illinois has about thirteen thousand miles of main-line railroads, or more than any state except Texas. Chicago is the greatest railway terminal in the world. It is the meeting point for nearly all the great trunk lines of the United States.

The municipal airport at Chicago is one of the largest in the world. It is a terminal for many transcontinental air lines. Other airports are found in the larger cities of Illinois. Several seaplane bases are maintained along the shores of Lake Michigan. Chanute Field at Rantoul is one of the largest aviation technical schools of the United States Air Force. Scott Field, near Belleville, is another large air-training base. There also is a United States Naval Air Station maintained at Glenview, near Chicago. This naval base was greatly expanded during World War II.

Press, Radio, and Television. The first newspaper in the Illinois country was the *Illinois Herald*, established at Kaskaskia in 1814. Leading journalists and writers who worked on newspapers in Chicago included Eugene Field, Finley Peter Dunne, George Ade, Ring Lardner, Edgar Lee Masters, Ben Hecht, and Carl Sandburg.

Today more than 800 newspapers and 700 periodicals are published in Illinois. In Chicago the leading newspapers are the *Tribune*, *Daily News*, *Sun-Times*, and *Herald-American*. Leading newspapers in other parts of the state include the Bloomington *Daily Pantagraph*, the Peoria *Journal-Transcript*, and the *Illinois State Journal* and the *Illinois State Register* of Springfield. Leading encyclopedias, trade magazines, and textbooks are published in Chicago.

Among the first radio-broadcasting stations in the state was WRM (We Reach Millions), opened by the University of Illinois in May, 1922. In 1925 the name was changed to WILL. In May, 1922, WMAQ began broadcasts from Chicago. Today many cities throughout the state have broadcasting stations. Illinois was a pioneer in television. Its first station, WBKB, was established in Chicago in 1943.

Social and Cultural Achievements

Educational Institutions: *State Teachers' Colleges*, Illinois State Normal University at Normal, established in 1857; Northern Illinois at DeKalb, 1895; Western Illinois at Macomb, 1899. *Other Colleges and Universities*, Aurora, Carthage, Eastern Illinois State, Elmhurst, Eureka, Greenville, Illinois, Knox, Lake Forest, McKendree, Monmouth, Mundelein, North Central, Olivet Nazarene, Quincy, Rockford, Roosevelt, Rosary, St. Procopius, Shurtleff, The Principia, and Wheaton colleges; Augustana College and Theological Seminary; Barat College of the Sacred Heart (women); Bradley University; College of St. Francis; MacMurray College for Women; St. Francis Xavier College for Women; University of Chicago; University of Illinois; DePaul, Illinois Wesleyan, James Millikin, Loyola, Northwestern, Southern Illinois universities. *Professional and Technological Schools*, Chicago Teachers, Chicago Musical, Concordia Teachers, and George Williams (physical education) colleges; National College of Education; Garrett Biblical Institute; St. Mary of the Lake Seminary; John Marshall Law and Sherwood Music schools; American Academy of Art; Art Institute of Chicago; Chicago Academy of Fine Arts; American Conservatory of Music; Chicago Conservatory; Chicago School of Expression and Dramatic Art; Columbia College of Drama and Radio; Chicago-Kent College of Law, Illinois Institute of Technology (formed in 1940 by merging Lewis Institute and Armour Institute of Technology); Aeronautical University, Inc.; Parks Air College, Inc.; Institute of Design.

State Welfare, Correctional, and Penal Institutions: *Children*, Illinois Soldiers' and Sailors' Children's School at Normal; Illinois School for the Blind and Illinois School for the Deaf at Jacksonville; training schools at St. Charles (delinquent boys) and at Geneva (delinquent girls). *Physically handicapped*, Illinois Industrial Home for the Blind at Chicago (adult); Illinois Eye and Ear Infirmary at Chicago. *Mentally handicapped*, hospitals for adults at Alton, Anna, Chicago (known as Dunning), East Moline, Elgin, Jacksonville, Kankakee, Manteno, and Peoria (includes Abbott Children's Center); hospitals for feeble-minded and epileptic children and adults at Dixon and at Lincoln. *Illinois Soldiers' and Sailors' Home* at Quincy. *Soldiers' Widows' Home of Illinois* at Wilmington. *Prisons*, at Joliet-Stateville, Pontiac, Menard, and Sheridan; a state penal farm at Vandalia. Illinois Security Hospital for mentally ill prisoners, at Chester. *State Reformatory for Women* at Dwight.

Education. The first schools in Illinois were taught by French missionaries. Later private schools were opened, usually in log cabins. The Northwest Ordinance of 1787 set aside sections of public land for the support of public schools. This law stated that "schools and the means of education shall be encouraged forever." But public schools were not common until 1854, when laws laying the foundation for the present system of public education were adopted by the Illinois General Assembly.

Administration of the public schools is the responsibility of the state superintendent of public instruction and the superintendent of schools in each county. The state and the county superintendents are elected for four-year terms. School boards control the educational systems in the cities and towns. Members of most of these boards are elected to office. In Chicago, however, members of the school board are appointed by the mayor.

Education is compulsory for children between the ages of seven and sixteen. The state pays 20 to 21 per cent of the cost of public education. The rest of the cost is paid from local taxes. Township and community high schools were established in 1919, and consolidated high schools in 1935. Free transportation is provided for the children of most rural schools. The state has special schools for physically handicapped children who cannot attend regular classrooms. Several city school systems have trade and technical schools.

There are several junior colleges for women. These include Ferry Hall at Lake Forest, Frances Shimer College at Mount Carroll, and Monticello College at Alton. Blackburn College at Carlinville is noted for its self-help plan, by which students work to pay for their board, room, and tuition. This college was founded in 1857 as a theological school.

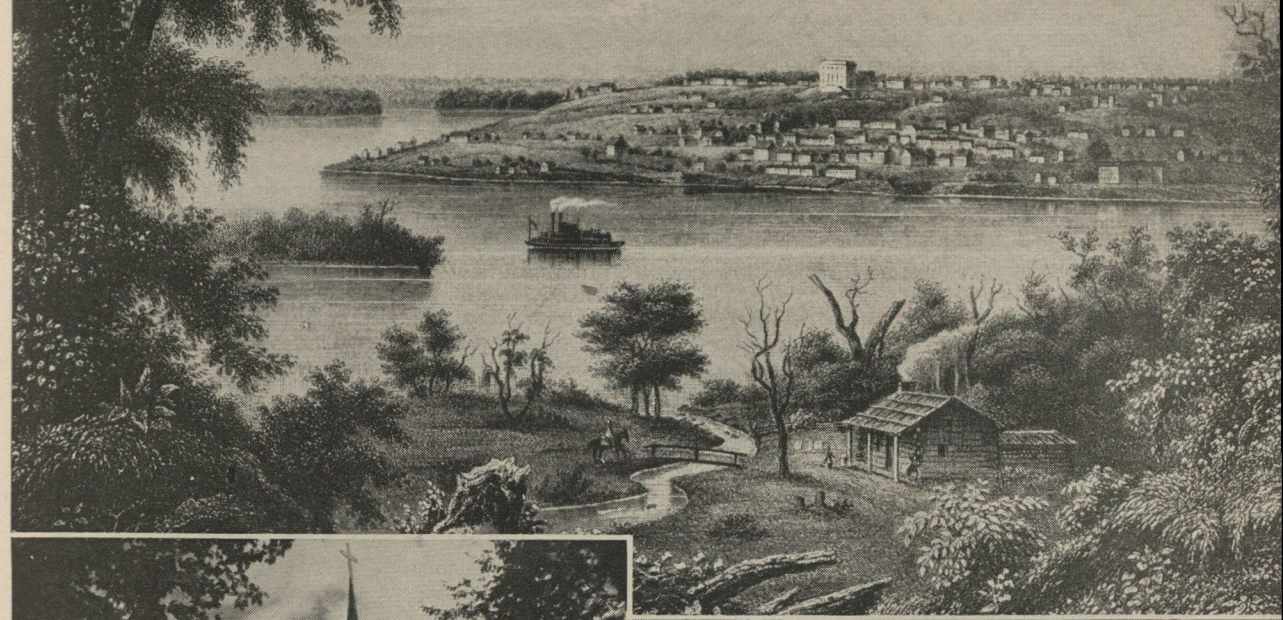
The accredited colleges and universities of Illinois are discussed under their separate titles in THE WORLD BOOK ENCYCLOPEDIA. For a list of these colleges and universities, see *Related Subjects* at the end of this article.

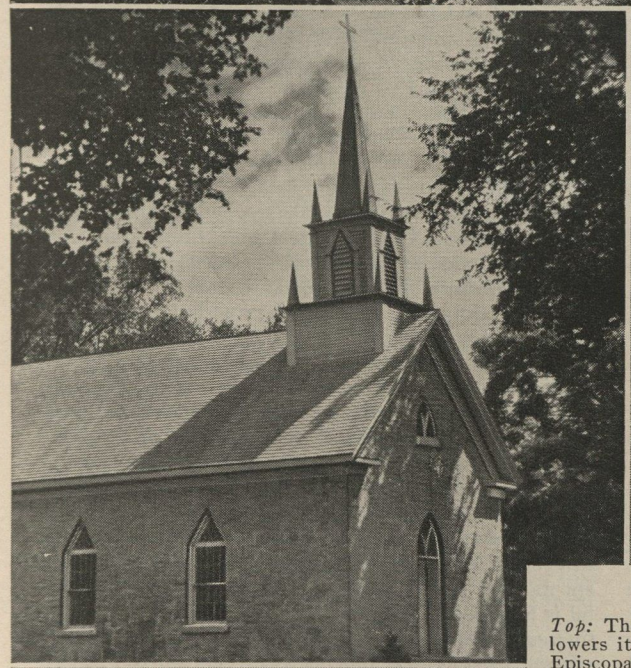
Libraries. A library at which fees were charged for books was established at Albion in 1819. A Sunday-school library was opened in Chicago in 1832. The first permanent free public library in Illinois was opened by the German Library Society of St. Clair County in 1839. Today Illinois has about four hundred library systems. They serve more than three fourths of the population.

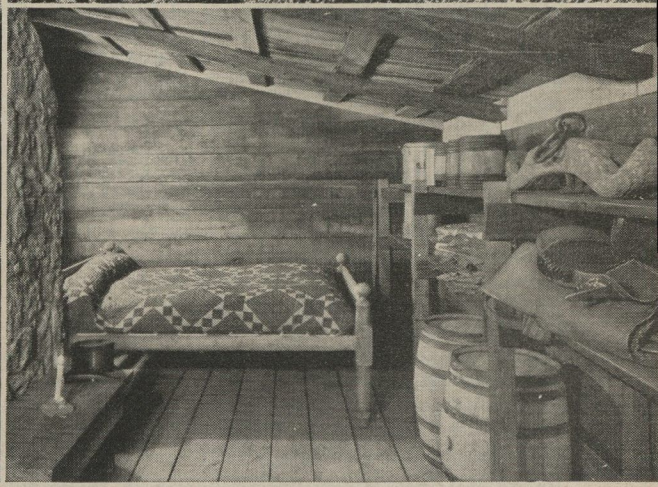
The largest library in the state is the Chicago Public Library. This was established after the Great Fire of 1871. Among those who contributed books to the Chicago Library were the Duke of Wellington, Thomas Hughes, Thomas Carlyle, Robert Browning, John Ruskin, and Lord Macaulay. When these books arrived at Chicago in 1872, they were stored in an iron water tank while the library building was under construction. The John Crerar Library, an internationally famous scientific library, is located in Chicago. Also in that city is the Newberry Library, which has famous collections of books on literature, the history of printing, music, history, genealogy, and the North American Indian.

The Illinois State Historical Library at Springfield has large collections of books on Illinois history and Abraham Lincoln. The Illinois State Library, also at Springfield, was established in 1839. This library gives research and reference service to state officers and employes, and assists public librarians throughout the state.

The University of Illinois library has more than two million volumes. This collection is especially noted for books on seventeenth-century history and literature.



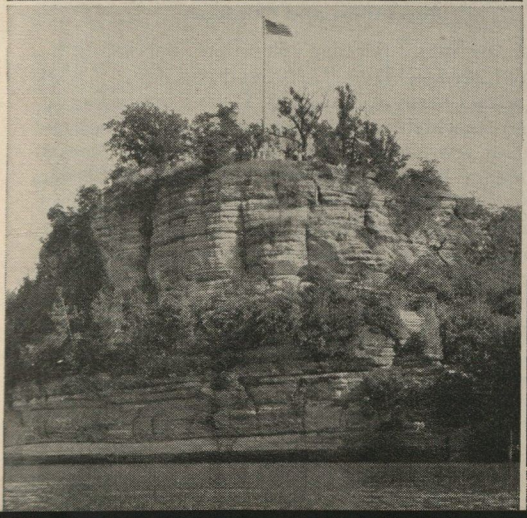


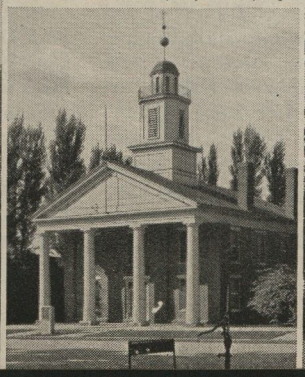


EARLY-DAY ILLINOIS

Top: The town of Nauvoo in 1840; founded by Joseph Smith and his followers it was at one time the largest town in Illinois. *Second left:* St. Peter's Episcopal Church in Grand Detour, one of the oldest churches in the state. *Above:* The lean-to of the Lincoln-Berry store, where Lincoln once slept, now in New Salem State Park. *Below left:* Historic Starved Rock in Starved Rock State Park, on the Illinois River near Ottawa. *Below center:* Metamora Court House, near Eureka, where Abraham Lincoln and Stephen Douglas practiced law in the 1840's. *Below right:* The house in which Joseph Smith, the famous Mormon leader, lived at Nauvoo before his death.

Photos Chi. Hist. Soc.; Pix, Wallace; Dept. of Pub. Wks. & Bldgs.; Ill. Development Council





There are nearly 1,500,000 books in the library of the University of Chicago, including many rare books and manuscripts. The largest collection in the world of books on dentistry is part of the library of Northwestern University. In 1951, the Midwest Inter-Library Center was dedicated in Chicago. Its primary function is the economical storage of little-used research books and newspapers for the fifteen participating universities and libraries.

Arts and Crafts. Many buildings in Chicago were planned by architects who made revolutionary changes in American architecture. Louis H. Sullivan is often said to have created a truly American style of architecture in the buildings he designed in Chicago. Daniel H. Burnham and John W. Root designed the Montauk Block in 1882. This was the first all-fireproof building in the world. Burnham and Root also helped to develop the skyscraper. Frank Lloyd Wright created his "prairie style" buildings in Chicago and other large Illinois cities.

Chicago had become the art capital of the Middle West even before the Great Fire of 1871. The Chicago Academy of Design became an art school in 1869, and the Chicago Academy of Fine Arts (now the Art Institute of Chicago) was established in 1879. The Art Institute has become one of the great art museums of the world, and its school is noted for having trained many distinguished artists. The most famous Illinois sculptor was Lorado Taft.

The first theaters in Illinois were built more than a hundred years ago. In the 1890's, many of the river towns of Illinois were visited regularly by showboats such as the *Cotton Blossom*. Traveling theatrical groups visited cities along the railroads. Chicago is now the theatrical center of the Middle West.

In early days, most of the music heard in Illinois was provided by singing schools, harmonic societies, and traveling troupes of singers, minstrels, and Swiss bell ringers. Music conservatories were established in the state after 1865. Musical organizations were formed in various communities, and many music festivals and contests were held. Opera began in Chicago in 1850. The Chicago Opera Company was formed in 1922, and the Civic Opera House was completed in 1929. The Chicago Symphony Orchestra was founded in 1891 by Theodore Thomas. Open-air concerts are held every summer in Grant Park and various other parks of Chicago. Outdoor concerts also are held in Ravinia Park, north of Chicago. Well-known composers who lived and worked in Illinois include George F. Root, composer of "Tramp, Tramp, Tramp, the Boys Are Marching" and the "Battle Cry of Freedom"; John Alden Carpenter, and Frederick Stock.

Many famous writers were natives of Illinois or did much of their work in the state. These include Eugene Field, Finley Peter Dunne, Hamlin Garland, Frank Norris, William Vaughan Moody, Henry B. Fuller, Carl Sandburg, Vachel Lindsay, Edgar Lee Masters, Lew Sarett, Ernest Hemingway, Edna Ferber, Margaret Ayer Barnes, and Janet Ayer Fairbank. *Poetry: A Magazine of Verse* was founded in Chicago in 1912 by Harriet Monroe. This is one of the outstanding magazines of its kind, and is credited with the "discovery" of many struggling and unknown poets who later became famous.

Religion. Christianity was brought to the Illinois country by the French missionaries. The Roman Catholic Church was the only active religious organization in the territory for more than a hundred years. The first Protestant sermon in Illinois was delivered at New Design in 1793 by Joseph Lillard, a Methodist circuit rider, or minister who traveled the frontier on horseback. Three years later a Baptist church was established at New Design. Quakers built a church on the Fox River in 1835. Four years later a group of Mormons who had been driven from Missouri settled at Nauvoo and built a church. The Mormons were unpopular, however, and in 1844 the Mormon leader, Joseph Smith, and his brother, Hyrum, were killed by a mob. Two years later the Mormon colony moved to Utah.

About 40 per cent of the church membership in Illinois is in the Roman Catholic Church. The Methodist church has the largest membership of Protestant denominations. There are many Mennonites living at Arthur and along the Illinois River between Forrest and Peoria. Zion, north of Chicago, is a city whose population is almost entirely composed of the followers of John Alexander Dowie, founder of the Christian Catholic Apostolic Church. The Bahá'í Temple at Wilmette is the world center of the Bahá'í faith. The Moody Bible Institute is located at Chicago. The Benedictine Convent of the Perpetual Adoration, which is one of three such convents in the Western Hemisphere, is located near Mundelein. Saint Sava Monastery, which is the headquarters of the Serbian Orthodox Church in the United States and Canada, was founded at Libertyville in 1923.

Social Welfare. The first social-welfare law in Illinois was a bill adopted in 1872 which provided for the establishment of safe working conditions in the coal mines. A law prohibiting child labor was adopted in 1891. The hours of labor for women were limited to eight hours a day under a law adopted in 1894. Compensation for workmen injured at their jobs was provided by state law in 1911. Illinois was first among the states to ratify the amendment to the United States Constitution which gives women the right to vote. The Illinois Department of Public Welfare was created in 1917. The state administers old-age assistance, and aid to dependent mothers and children. The Galesburg State Hospital is for research on problems of the aged. A state retirement fund is provided for teachers.

Recreation and Outdoors

There are many popular recreation areas along the shores of Lake Michigan. The sand dunes north of Waukegan attract many vacationists. Cook County has forest preserves which cover about 35,000 acres. There are more than 200 carefully tended parks in the Chicago Park District. The Illinois Ozark region and Jo Daviess County are noted for their beautiful scenery. Many lakes have facilities for fishing, boating, and swimming.

Sports and public amusements are favorite recreations of the people of Illinois. The first Ferris wheel was used at the World's Columbian Exposition in Chicago in 1893. (See FERRIS WHEEL.) In the same year the first eighteen-hole golf course in the United States was built at Wheaton. In 1895 the first automobile race in the world was

run over a road between Chicago and Waukegan. The first large indoor football game was played at Chicago in 1896. The first national bowling tournment was held in Chicago in 1901. Horse races are run at several tracks in the Chicago area every season. Chicago has baseball teams in the American and the National leagues. The city is also represented by professional football and hockey teams.

State and National Forests. Illinois has three state forests which cover a total area of more than 10,000 acres. These are Union (3,520 acres), Mason (5,506 acres), and Henderson (1,050 acres). Each of these state forests is named for the county in which it is located. Shawnee National Forest (801,944 acres) was created in 1941 in southern Illinois.

State Parks, Monuments, and Memorials cover about 25,000 acres in Illinois. The state maintains the Lincoln Trail Parkway (107 acres) near Decatur. Another parkway includes about 1,000 acres along both banks of the Illinois and Michigan Canal between Channahon and Morris. The state parks include:

Bishop Hill (2.5 acres) near Galva. Site of a religious community founded in 1846 by Swedish settlers led by Eric Janson. All property was owned in common. Several of the old buildings may be seen, as well as a collection of American primitive paintings. Created, 1945.

Black Hawk (207 acres) near Rock Island. This park was named for the famous Indian chief who fought a battle here to save the land for his people. It is often called the oldest park in the Middle West, since it was the site of feasts and games held by the Sauk and Fox Indians. Its museum on Watch Hill Tower, which rises seventy-five feet above the scenic Rock River, contains the famous Hauberg collection of Indian relics. Created, 1927.

Cahokia Mounds (145 acres) near East St. Louis. These are among the largest earth mounds built by Indians hundreds of years ago. The largest is Monk's Mound. It is named for the Trappist monks who built a community near the mound in 1808 and lived there until 1813. Monk's Mound is 100 feet high and covers sixteen acres, which is a larger area than that covered by the Pyramid of Cheops in Egypt. A museum containing Indian relics is located in the park. Created, 1925.

Cave-in-Rock (65 acres) near Elizabethtown. Named for a large cave in the bluffs along the Ohio River. The cave was once used by the Indians, who called it the "Habitation of the Great Spirit." Later the cave was used as the headquarters of outlaw gangs who raided river boats and took their cargoes. Created, 1929.

Chain O' Lakes (4,500 acres) in Lake County. Has facilities for fishing, boating, and camping. It includes Fox, Grass, Pistakee, and other lakes. Created, 1935.

Fort de Chartres (21 acres) near Prairie du Rocher. This was the center of the French civil and military government in the Illinois country. The fort has been partly rebuilt. Fort de Chartres was the last outpost to lower the French flag in the United States. There is a museum which has a collection of relics.

Fort Kaskaskia (201 acres) near Chester. The site of a fort which once overlooked the French settlement of Kaskaskia. The town was destroyed by a flood when the Mississippi River changed its course in the 1890's. Near by is the home of Pierre Menard, the first lieutenant governor of Illinois. It was built in 1802. Created, 1927.

Fort Massac (456 acres) near Metropolis. A recreational center on the site of an old French fort. This was the spot where the George Rogers Clark expedition first entered the Illinois country. Created, 1903.

Giant City (1,163 acres) near Carbondale. Named for its large rock formations, which look like the ruins of a city. This area was a hiding place for deserters from the Union Army during the War between the States. Created, 1927.

Mississippi Palisades (787 acres) near Savanna. Noted for its rugged cliffs which overlook the Mississippi River. Within the park are caves, strange rock formations, old Indian trails, mounds, and relics. There are many wild animals in the wooded ravines. Created, 1929.

New Salem (281 acres) near Petersburg. Contains a replica of the town in which Abraham Lincoln lived as a young man. Among the buildings are the old cooper shop in which Lincoln studied at night, and the tavern and store in which Lincoln was a partner. Created, 1919.

Pere Marquette (5,180 acres) near Alton. This park is near the spot where the Illinois and Mississippi rivers meet. A cross marks the place where the explorers Marquette and Joliet are believed to have entered the Illinois country. Created, 1932.

Starved Rock (1,443 acres) near La Salle. The rock rises a steep 125 feet on the south bank of the Illinois River. Its top area covers about an acre. It takes its name from a legend about a band of Illinois Indians who are supposed to have hidden on top of this rock after escaping from Potawatomi Indians. The fugitives are said to have starved to death here, surrounded by their enemies. The rock later was the site of the French Fort Saint Louis. Created, 1911.

White Pines Forest (315 acres) near Oregon. Contains the southernmost forest of virgin white pine in the Middle West. *Grand Detour*, one of the oldest and most historic towns of Illinois, is near the park. Created, 1937.

Other Interesting Places to Visit which attract thousands of persons to Illinois every year include:

Black Hawk Statue, near Oregon. See BLACK HAWK.

Brookfield Zoo. See CHICAGO (Zoological Garden).

Dickinson Mound, near Lewiston. This mound has been partly opened, and contains Indian skeletons, tools, and weapons in the position in which they were buried hundreds of years ago. There is a museum which contains relics of the Stone Age and of Indian life.

Metamora Court House. One of the courthouses in which Abraham Lincoln practiced as a circuit-riding lawyer. It is an excellent example of the early Greek Revival architecture. It has been a state memorial since 1921.

Morton Arboretum, near Downers Grove. Covers about 700 acres, with about 5,000 kinds of trees and plants.

Mount Pulaski Court House. This is another courthouse where Lincoln practiced as a lawyer. It was created a state memorial in 1935.

Nauvoo. Mormon community founded by Joseph Smith on the banks of the Mississippi River in 1839. Visitors may see the homes of Smith and of Brigham Young and Wilford Woodruff, two of the early Twelve Apostles of the Mormon Church. The graves of Smith and his brother, Hyrum, are also located here. There are several old buildings built by the Mormons and by French settlers.

Saint Mary of the Lake Seminary, near Mundelein. One of the largest Roman Catholic seminaries in the world. It is noted for its beautiful buildings and grounds.

Ulysses S. Grant Home, near Galena. This home is furnished much as it was when General Grant lived in it. The house was built in 1857. It has been a state memorial since 1932.

Vandalia Court House. This attractive colonial building was the state Capitol from 1836 to 1839. Lincoln served his first term as a state representative here.

See also FORT SHERIDAN; GREAT LAKES NAVAL TRAINING CENTER.

Government

National: Electoral votes, 27. Representatives in Congress, 25.

State: Senators, 51; representatives, 153. *Capital,* Kaskaskia, 1809 to 1820; Vandalia, 1820 to 1839; Springfield since 1839.

Counties: 102.

Illinois is governed under a constitution which was adopted in 1870. Earlier constitutions were those of 1818 and 1848. The present constitution has been difficult to change because of its limited provision for amendments. In 1950, Illinois voters adopted the Gateway Amendment, which requires only a two-thirds majority of all votes cast on a proposed amendment for its approval. Before, a majority of the total votes cast in the election was required. Also, three proposed amendments instead of one may now be submitted at any one election.

Executive officers include a governor, lieutenant governor, secretary of state, treasurer, auditor of public accounts, superintendent of public instruction, and attorney general. Each of these officers is elected for four years, except the treasurer, who is limited to a two-year term. The treasurer cannot be re-elected for at least two years after he has left the office.

In 1917 more than 150 state agencies were combined into nine departments. The number of these departments was later increased to thirteen. The directors of these departments are appointed by the governor with the approval of the state senate. These departments cover aeronautics, agriculture, conservation, finance, insurance, labor, mines and minerals, public health, public safety, public welfare, public works and buildings, registration and education, and revenue. The governor may also appoint boards and commissions to carry on special work of the state.

Legislative power is vested in a general assembly made up of a senate and a house of representatives. Senators are elected for four years. Representatives serve two-year terms. Illinois has a method of electing representatives which is not followed by any other state. Each voter has three votes. He may give one vote to each of three candidates, or give one and one half votes to each of two candidates, or he may cast all three votes for one candidate. This is called "cumulative voting." It allows small groups of people to be represented if the members of the group confine their votes to one or two particular candidates for the legislature.

Judicial decisions are made by a system of courts headed by the state supreme court. The supreme court is made up of seven justices who are elected for nine years. At least four justices must agree before a decision can be handed down by this court. There are four appellate courts and seventeen circuit courts in the state. Cook County, including Chicago, makes up one judicial district. This county has its own superior and circuit courts, as well as various minor courts.

Local Government is run with the county as a unit. Eighty-five counties in the northern and central parts of the state are divided into townships like those of the New England States. The other seventeen counties of Illinois have the county commissioner form of government. Cook County has a combination of both systems. It has a county board made up of fifteen commissioners. Ten of the commissioners are elected from Chicago, and the other five are elected from the other townships of the county. Each commissioner serves a term of five years.

National Politics. The returns in national elections are sometimes close. Chicago is a stronghold of the Democratic party, while the Republican party has its greatest strength downstate. See POLITICAL PARTY (chart).

Illinois has given the nation two Presidents, Abraham Lincoln and Ulysses S. Grant. Two Vice-Presidents, Adlai Ewing Stevenson and Charles G. Dawes, were born in Illinois. Other outstanding political leaders from the state include Stephen A. Douglas, John A. Logan, Joseph G. Cannon, James Hamilton Lewis, and Franklin Knox. William Jennings Bryan and William E. Borah were born in Illinois. James Shields rose to fame while a resident of the state. See STATUARY HALL.

Famous Illinois Men and Women

Many famous Illinoisans have separate biographies (see *Biographies* in the list of *Related Subjects* at the end of this article). Others who achieved state, national, or international fame include:

Bacon, Henry (1866-1924), born at Watseka, the architect who designed the Lincoln Memorial in Washington, D.C.

Grange, (Red) Harold (1903-), born in Wheaton. University of Illinois football player (1923-1925); became known as the greatest halfback of the era. In 1925, he signed with the Chicago Bears and continued in professional football for thirteen years. In 1950, Grange was elected to the Football Hall of Fame.

Harrison, Carter Henry (1860-), born in Chicago. Mayor of Chicago for five terms, covering the periods from 1897 to 1905 and from 1911 to 1915. Harrison was publisher and editor of the *Chicago Times* from 1891 to 1894. He served as United States Collector of Internal Revenue for the Chicago area from 1933 until 1943.

Lawson, Victor Freemont (1850-1925), born in Chicago. Publisher who made *The Chicago Daily News* one of the outstanding newspapers in the United States. He was one of the first American publishers to send correspondents to foreign countries. Lawson served a term as president of the Associated Press, during which time he helped to establish its foreign news service. He was a sponsor of postal-savings banks and supported many reforms in Chicago and Illinois laws.

Lovejoy, Owen (1811-1864), was a brother of Elijah Parish Lovejoy. Owen Lovejoy preached many sermons against slavery while he was a minister at Princeton from 1838 to 1854. He continued the fight against slavery while serving in the Illinois General Assembly (1854-1856), and as a member of Congress (1856-1864).

McCormick, Robert Rutherford (1880-), born in Chicago. A lawyer, and editor and publisher of the *Chicago Tribune.* He was president of the Sanitary District of Chicago from 1905 to 1910. Attached to General Pershing's staff and attained rank of Colonel in World War I. Wrote numerous short works on historical, military, scientific, legal, and political subjects.

Medill, Joseph (1823-1899), born near Saint John, New Brunswick. Publisher and part owner of the *Chicago Tribune* for many years. Medill was one of the founders of the Republican party, and sponsored Abraham Lincoln as a candidate for President. He was mayor of Chicago from 1871 to 1873.

Murphy, John Benjamin (1857-1916), born near Appleton, Wis. Noted for his abdominal operations, he is sometimes called "the surgical genius of his generation."

Palmer, John McAuley (1817-1900), born at Eagle Creek, Ky. A lawyer who served as an officer in the Union Army during the War between the States. He

was governor of Illinois from 1869 to 1873, and served as a United States Senator from 1891 to 1897. Palmer was a Democratic candidate for President in 1896.

Palmer, Potter (1826-1902), born in Albany County, N.Y. Merchant who revolutionized the selling methods of his day by encouraging customers to take merchandise home and inspect it before purchasing, and to exchange or return unsatisfactory goods. Palmer built the Palmer House, one of the largest and most elaborate hotels in Chicago. He was a real-estate promoter, and was responsible for many Chicago improvements. His wife, Bertha Palmer (1849-1918), was a leader of Chicago society. She was noted for her gifts to charity. Mrs. Palmer was a sponsor of the World's Columbian Exposition in 1893.

Root, John Wellborn, Jr. (1887-), born in Chicago. An architect with firm that built Soldier Field, Palmer House, Board of Trade, and Palmolive buildings in Chicago. Awarded gold medal in 1930 by New York Architectural League.

Shedd, John Graves (1850-1926), born at Alstead, N.H. A merchant and philanthropist, he was active in Chicago's civic affairs. Donated $3,000,000 to build the famous Shedd Aquarium at Chicago.

Starr, Ellen Gates (1859-1940), born at Laona. Social worker who helped Jane Addams to found Hull House. Miss Starr worked in the settlement house forty years.

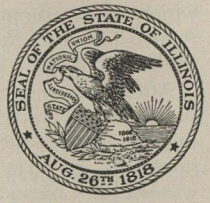
Stone, Mulville Elijah (1848-1929), born at Hudson. One of the founders of *The Chicago Daily News* in 1875. He was general manager of the Associated Press of Illinois, and helped to make the Associated Press a world-wide news-gathering agency. Stone helped to obtain peace during the Russo-Japanese War (1904-1905).

Ward, A. Montgomery (1843-1913), born at Chatham, N. J. One of the founders of the first mail-order house in the world in 1872. He led a movement to keep the Chicago lake front a public park. Ward's widow gave large sums to various charities and to the medical and dental schools of Northwestern University.

Wright, John Stephen (1815-1874), born at Sheffield, Mass. A publisher, merchant, and real-estate promoter. He owned and edited the *Prairie Farmer*, which is one of the oldest farm papers in the world. Wright built the first public school in Chicago at his own expense.

State Symbols and Events

State Seal: The American eagle stands on a boulder clutching a shield in his claws. The shield bears stars and stripes which represent the original thirteen states. Below the shield is an olive branch, which is the emblem of peace. The eagle holds in his beak a white streamer which reads "State Sovereignty National Union." The prairie with the rising sun in the background represents the plains of Illinois. The dates on the rock represent the year Illinois was admitted to the Union (1818) and the year in which the seal was adopted (1868).



State Flag: The state seal is in the center of a field of white, which is bordered in gold. The flag was adopted by the state legislature in 1915 from a design submitted by the Rockford Chapter of the Daughters of the American Revolution. See FLAG (color plate, Flags of the States.)

State Motto: State Sovereignty, National Union.

State Bird: Cardinal bird. See BIRD (color plate, Common American Songbirds).

State Flower: Violet. See FLOWER (color plate, Woodland Flowers).

State Tree: Oak.

State Song: "Illinois." Words by Charles H. Chamberlain; sung to the tune of "Baby Mine," composed by Archibald Johnston.

Annual State Events. Among the interesting events on the state calendar are:

Golden Gloves Boxing Tournament, Chicago, in February.

Booster Rooster Day, Prophetstown, in spring. Merchants attract business by paying three cents a pound above the market price for roosters, and lining the streets with crates of the noisy fowls.

Lilac Festival, Lombard, in spring when the lilacs are in full bloom.

Passion Play, Bloomington, in April and May.

Passion Play, Zion, on Sundays from Palm Sunday through June.

Easter Sunrise Service, Soldier Field in Chicago, on Easter Sunday.

Watermelon Festival, Havana, usually late in August.

Beardstown Fish Fry, Beardstown, usually in August.

Illinois State Fair, Springfield, late in August.

Melon Day, Thomson, Labor Day.

Festival of the Grape, Nauvoo, in September.

Chrysanthemum Show, Garfield Park Conservatory in Chicago, in November.

International Live Stock Exposition, Chicago, early in December.

History

1673 Joliet and Marquette first visited Illinois.
1680 La Salle built Fort Crevecoeur on the Illinois River near present-day Peoria.
1699 Cahokia, oldest town in Illinois, established.
1763 Illinois included in the territory given to England by the French in the Treaty of Paris.
1778 George Rogers Clark captured Cahokia and Kaskaskia.
1783 Illinois became part of the United States.
1787 Illinois became part of the Northwest Territory.
1800 Illinois included in the Territory of Indiana.
1809 Territory of Illinois established.
1812 Indian massacre at Fort Dearborn.
1818 Illinois admitted to the Union.
1832 Indians defeated in the Black Hawk War.
1833 Chicago became a town.
1848 Illinois and Michigan Canal completed.
1858 Lincoln and Stephen A. Douglas toured the state, speaking in a series of debates.
1871 Great Chicago fire.
1886 The Haymarket Riot in Chicago.
1892 John P. Altgeld elected as reform governor.
1893 World's Columbian Exposition held in Chicago.
1900 Chicago Drainage Canal completed and opened.
1907 Hennepin Canal opened.
1914 State-wide system of hard-surfaced roads begun.
1933-1934 A Century of Progress Exposition in Chicago.
1942 Industries expanded rapidly to meet war needs.
1945 Illinois began postwar expansion plans.

Mound Builder and Indian Days. More than ten thousand mounds scattered throughout what is now Illinois prove that the region was once the home of the Mound Builders. Some of the most interesting burial mounds in the Middle West are found in Illinois.

The Illinois Indians made the territory their hunting grounds when the first white men came. The Illinois were a federation of six tribes belonging to the Algonquin Indian family. These tribes were the Cahokia, the Kaskaskia, the Michigamea, the Moingwena, the Peoria, and the Tamaroa. The Iroquois Indians attacked the Illinois tribes in 1680 and killed large numbers of them. Other tribes which moved into the Illinois country and played a part in its early history included the Chippewa, the Ottawa, the Potawatomi, the Sauk, the Fox, the Winnebago, the Kickapoo, the Muscouten, and the Piankashaw. See INDIAN, AMERICAN.

The French and English Periods. Father Jacques Marquette and Louis Joliet are believed to have been the first white men to enter the Illinois country. These French explorers paddled their canoes down the Mississippi River in 1673. They traveled along the western boundary of what is now Illinois, and returned northward by way of the Illinois River. Marquette returned to the region in the winter of 1674 and 1675, and founded a mission for the Kaskaskia Indians near the present city of Utica. La Salle returned to the Illinois River in 1680 and built Fort Crevecoeur (Broken Heart) near where Peoria is now located. In 1682 La Salle built Fort Saint Louis on Starved Rock beside the Illinois River.

The first permanent town in the Illinois country was Cahokia. It was founded in 1699. Kaskaskia was established in 1703. These two towns became the chief trading centers of the region. Later Fort de Chartres was built about seventeen miles north of Kaskaskia on the east bank of the Mississippi River. This fort for a time was the strongest fortification in North America. The French remained in control of the region until the end of the French and Indian Wars in 1763. Then the Illinois territory was given to the British.

The English did not succeed in making friends with the French settlers, most of whom soon moved west across the Mississippi. After that a few English settlers made their home in the region. Pontiac, an Indian chief, led several Indian rebellions against the English. These uprisings ended when Pontiac was killed by an Illinois Indian at Kaskaskia. See PONTIAC.

Early National Period. The Illinois frontier played an important part in the Revolutionary War in spite of the great distance from the Atlantic Coast. George Rogers Clark and a band of frontiersmen called the "Long Knives" captured Kaskaskia and Cahokia from the English in 1778. As a result of this victory, the region became a part of the United States. In 1787 the Illinois country was included in the Northwest Territory, and in 1800 was made a part of the Indiana Territory. The Illinois Territory was created from what is now Illinois and Wisconsin in 1809. Kaskaskia became the capital.

There was trouble with the Indians throughout the period of the Illinois Territory. The Indians grew unfriendly as they saw more and more of their lands being taken away by white settlers. The worst Indian uprising was in 1812, when many whites were massacred at Fort Dearborn on the site of Chicago.

Progress as a State. Illinois was admitted to the Union as the twenty-first state on December 3, 1818. The new state had a population of about 40,000 persons. Nathaniel Pope, who was then a delegate to Congress, succeeded in having the northern border of the territory extended sixty-one miles. This lengthening of the border brought the Chicago area, the lead deposits around Galena, and the rich dairy section of the north into the new state. Today more than half of the people of Illinois live in the area which was added because of Pope's urging.

Settlement of the new state was slow for many years because of the Indian uprisings. The state was free to develop more rapidly after the Indian tribes were defeated in the Black Hawk War of 1832. The Sauk and the Fox, which were the only Indian tribes remaining in Illinois, then moved west across the Mississippi River.

The population of Illinois grew to three times its original size between 1820 and 1830. Many improvements were made which attracted new settlers to the state. The Illinois and Michigan Canal was completed in 1848. This made it possible for farmers to ship large quantities of grain to eastern markets on barges. Later, railroads were built to carry farm products to market.

In 1858 Illinois attracted nation-wide attention because of the famous debates between Abraham Lincoln and Stephen A. Douglas.

During the early days of the War between the States there were many Confederate sympathizers in southern Illinois. Meetings were held in southern counties and there was talk of setting up a separate state. In the elections to the constitutional convention of 1861, there were twice as many Democrats as Republicans. But on the whole, the state was pro-Union. It contributed Lincoln as the wartime President, Ulysses S. Grant as the Union Army's most brilliant general, and more than 250,000 Union soldiers.

The industrial development of Illinois was rapid after 1865. The number of railroads increased. Chicago became the largest grain and livestock market center in the United States. A large part of Chicago was destroyed by fire in 1871. Labor riots occurred in 1885 and 1886, and were climaxed by the riot in Haymarket Square. The farmers joined with city labor in 1892 to elect Governor John P. Altgeld, who sponsored many reforms during his administration. The World's Columbian Exposition was held in Chicago in 1893, during the time of the worst depression of the 1800's. Twenty-four local banks failed in the first eight months of that year in Illinois. Mills, factories, and mines throughout the state closed down. The depression lasted until 1898. Within the next few years the state quickly recovered.

By 1900 Illinois industry had grown so rapidly that more than half of the population of the state was employed in the cities.

During World War I Illinois was one of three states which furnished entire National Guard divisions to the Army. The Illinois division was the famous 33rd, or Prairie Division.

After the war there were fewer farms in Illinois, but the cities grew rapidly. New industries were established throughout the state, and transportation and roads were improved. In 1933 A Century of Progress Exposition was held in Chicago. It proved so successful that the exposition was held over for another year.

With the outbreak of World War II, Illinois farms, mines, and factories increased their production to meet war needs. Airplanes, tanks, guns, and ships were made in various parts of the state, especially in Chicago. The army and navy training centers in Illinois were expanded and turned out thousands of trained troops for the armed forces. At the end of the war, the Illinois state government had plans ready for the further expansion of the industry and agriculture of the state. P.M.A.

Related Subjects. The reader is referred to:

BIOGRAPHIES

Addams, Jane — Altgeld, John P.

Armour, Philip D.
Austin, Mary H.
Borah, William E.
Breasted, James H.
Breger, "Dave," David
Briggs, Clare A.
Bryan, William J.
Burnham, Daniel H.
Burnham, Sherburne W.
Cannon, Joseph G.
Carpenter, John Alden
Cartwright, Peter
Crane, Frank
Darrow, Clarence S.
Dawes, Charles G.
Deere, John
DosPassos, John R.
Douglas, Stephen A.
Dowie, John A.
Dunne, Finley Peter
Ellsworth, Lincoln
Enright, Elizabeth
Farrell, James T.
Ferber, Edna
Field (Family)
Field, Eugene
Fisher, "Bud," Harry C.
Fuller, Melville W.
Garden, Mary
Gary, Elbert H.
Goodspeed, Edgar J.
Goudy, Frederic W.
Grant, Ulysses S.
Hackett, Charles
Hale, George E.
Harlan, James
Harper, William R.
Hay, John M.
Hemingway, Ernest
Herrick, Robert
Hickok, James B.
Holmes, Burton
Hubbard, Elbert G.
Hutchins, Robert M.
Ingersoll, Robert G.
Johnson, Martin E.
Jones, Elizabeth Orton
Judson, Harry Pratt
Keeley, Leslie
Knox, Frank
Landis, Kenesaw M.
Lathrop, Julia C.
Lee, Doris E.
Lincoln, Abraham
Lincoln, Robert T.
Lindsay, Vachel
Logan, John A.
Lovejoy, Elijah P.
Lovett, Robert M.
McCormick, Cyrus H.
McCutcheon, John T.
MacLeish, Archibald
Marquis, Don
Masters, Edgar Lee
Meigs, Cornelia L.
Millikan, Robert A.
Mitchell, John
Monroe, Harriet
Moody, Dwight L.
Moody, William Vaughan
Morgenstern, Julian
Mundelein, George
Neihardt, John G.
Nevins, Allan
Newberry, Walter L.
Norris
Oboler, Arch
Owen, Ruth Bryan
Palmer, Alice E. F.
Pinkerton, Allan
Poole, Ernest
Pullman, George M.
Ridgway, Robert
Root, George F.
Rosenwald, Julius
Rutledge, Ann
Sandburg, Carl
Sarett, Lew
Schipa, Tito
Schwatka, Frederick
Scott, Walter Dill
Sheen, Fulton John
Shields, James
Skinner, Cornelia Otis
Spalding, Albert
Stock, Frederick A.
Swift (Family)
Taft, Lorado
Thomas, Theodore
Tietjens, Eunice H.
Van Doren, Mark
Ward, Lester F.
Ward, Lynd K.
Washburne, Elihu B.
Willard, Frances E. C.
Wright, Frank Lloyd
Young, Ella Flagg
Ziegfeld, Florenz

Chief Products

Alfalfa
Apple
Candy
Cattle
Clock
Coal
Corn
Egg
Fluorite
Glass
Hay
Hog
Iron and Steel
Meat Packing
Natural Gas
Oats
Peach
Petroleum
Soybean
Tripoli
Wheat

Cities and Towns

Alton
Aurora
Berwyn
Bloomington
Cairo
Champaign-Urbana
Chicago
Cicero
Decatur
East St. Louis
Evanston
Galesburg
Jacksonville
Joliet
Moline
Oak Park
Peoria
Quincy
Rockford
Rock Island
Springfield

Colleges and Universities

Augustana College and Theological Seminary
Aurora College
Barat College of the Sacred Heart
Bradley University
Carthage College
Chicago, University of
Chicago Musical College
Chicago Teachers Coll.
Concordia Teachers Coll.
DePaul University
Elmhurst College
George Williams College
Illinois, University of
Illinois College
Illinois Institute of Technology
Illinois State College, Eastern
Illinois State Normal U.
Illinois State Teachers College
Illinois Wesleyan University
James Millikin University
Knox College
Lake Forest College
Loyola University
MacMurray College
Monmouth College
Mundelein College
North Central College
Northwestern University
Principia, The
Rockford College
Roosevelt College
Rosary College
St. Francis, College of
St. Francis Xavier College
Southern Illinois Univ.
Wheaton College

History

Black Hawk
Clark, George Rogers
Fort Dearborn
French and Indian Wars
Hennepin, Louis
Indian, American
Joliet, Louis
La Salle, Robert C.
Marquette, Jacques
Mormon
Mound Builders
Northwest Territory
Ordinance of 1787
Pontiac
Tonti, Henryde
Young, Brigham

Rivers and Lakes

Illinois River
Michigan, Lake
Mississippi River
Ohio River
Rock River
Wabash River

Transportation

Canal
Chicago Sanitary and Ship Canal
Dixie Highway
Lakes-to-Gulf Waterway
National Road
Subway

Unclassified

Air Rights
Bahá'í
Board of Trade
Chicago, Art Institute of
Chicago Natural History Museum
Food (Famous Foods of the United States)
Fort Sheridan
Glenview Naval Air Station
Great Lakes Naval Training Center
Hull House
International Live Stock Exposition
Moody Bible Institute
Pioneer Life
Stadium

Books for Young Readers

Bailey, Bernadine (Freeman). *Picture Book of Illinois.* A. Whitman, 1949.

Blatchford, Frances L. and Erminger, L. W. *Illinois Grows Up.* McClurg, 1941. Attractive ABC history for those in the elementary grades.

Carlson, Theodore Leonard and Others. *Illinois Government and Institutions; Supplement to Textbooks in the Social Studies.* Allyn, 1949.

Horn, Madeline Daggett (Darrough). *Log Cabin Family.* Scribner, 1939. Simple account of pioneer family, giving an interesting view of life of long ago.

Meadowcroft, Enid L. *By Secret Railway.* Crowell, 1948. The adventures of a Chicago boy on the "Underground Railway" in 1860, adventures that were climaxed by his meeting with President-elect Lincoln.

Monaghan, James. *This Is Illinois; A Pictorial History.* University of Chicago Press, 1949.

Books for Adults

GRAY, JAMES. *The Illinois*. Rinehart, 1940. (Rivers of America series.) History of the stream and its surrounding territory.

GRIERSON, FRANCIS. *The Valley of Shadows*. Houghton, 1948. Author's boyhood in Illinois, just before the War between the States.

Illinois: A Descriptive and Historical Guide. (American Guide series.) rev. ed. McClurg, 1947. Blends the historic past with the present.

LOHMANN, KARL B. *Cities and Towns of Illinois; A Handbook of Community Facts*. University of Illinois Press, 1951.

MASTERS, EDGAR L. *The Sangamon*. Rinehart, 1942. (Rivers of America series.) Story of the sleepy river which flows through the Lincoln country.

PEASE, THEODORE. *Story of Illinois*. rev. ed. University of Chicago Press, 1949. Presents the story of the state as related to the broad stream of events. The final chapter, "The Illinois of the Present," embraces developments from 1918 to 1948.

An Outline suitable for Illinois will be found with the article "State."

Questions

Why are Illinois farmers indebted to the glaciers of the Ice Age?

Where are the following and why are they so named (1) Garden Spot of the Nation, (2) Egypt, (3) Hudson of the West, (4) Plow City?

Why has Illinois been able to introduce farm machinery more extensively than many other states?

In what Illinois cities are the following manufactured: watches and clocks, furniture, farm implements, railway equipment, meat products, cornstarch and corn sirup, glass bottles?

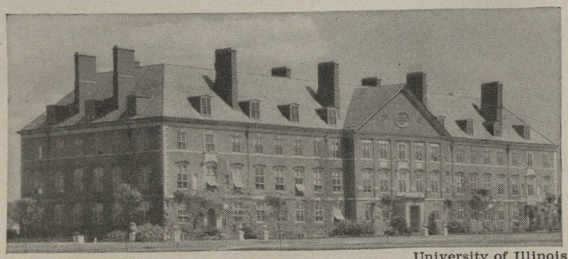
For what are the following Illinoisans famous: John Deere, Frank Lloyd Wright, Theodore Thomas, Frederick Stock, Carl Sandburg, John S. Wright?

What is the Gateway Amendment?

What important contributions did Illinois make to the Union cause during the War between the States?

ILLINOIS, UNIVERSITY OF, is a state-supported, coeducational school, with campuses at Urbana-Champaign and in Chicago. The main campus is at Urbana-Champaign. The medical campus and the Navy Pier division of the University of Illinois are in Chicago.

The University has many colleges and schools. At Urbana-Champaign are the colleges of agriculture, commerce, communications, veterinary medicine, education, engineering, fine and applied art, and liberal arts and sciences. The library school, the graduate school, and schools of journalism, law, and physical education are also on the main campus. On the medical campus in Chicago are the colleges of dentistry, medicine, pharmacy, and school of nursing. In 1946, to accommodate veterans of World War II, the University of Illinois established a branch on Navy Pier, Chicago, and gave instruction at other places. This branch was continued after the war.



University of Illinois

The Agriculture Building at the University of Illinois is a fine example of the Georgian architecture used in most of the campus buildings. The university's courses in agriculture attract students from all parts of the country.

Numerous research units are included in the university organization. Extension activities are carried on in agriculture and home economics. The university library contains over 2,000,000 books and publications.

Students in Urbana-Champaign live in university residence halls and approved private homes, as well as in the fifty-five fraternity and twenty-four sorority houses. About one third of the students work part time in order to earn part of their college expenses. The university offers a wide variety of student activities and organizations, and has a well-developed athletic program.

The University was opened on March 2, 1868, as the Illinois Industrial University. The name was changed in 1885 to the University of Illinois. The enrollment at Urbana-Champaign is 16,000. Enrollment in the Chicago branches is about 5,000. A.R.WI.

ILLINOIS AND MICHIGAN CANAL. See CANAL (Canals of the United States).

ILLINOIS AND MISSISSIPPI CANAL. See CANAL (Canals of the United States).

ILLINOIS COLLEGE is a coeducational liberal arts school at Jacksonville, Ill. It is controlled by the Presbyterian and Congregational churches. The college was founded in 1829 and has an enrollment of about 300. William Jennings Bryan was an alumnus of Illinois College.

ILLINOIS INDIAN. See INDIAN, AMERICAN (Eastern Woodsmen).

ILLINOIS INSTITUTE OF TECHNOLOGY is a privately endowed coeducational school in Chicago. Undergraduate courses include architecture, engineering, arts and sciences, and home economics. The graduate school offers work in architecture, engineering, and science. Other divisions of the Institute are the Institute of Gas Technology, which combines the functions of graduate training and research for the gas industry; and the Armour Research Foundation, which serves industry and the public in fields of applied and fundamental research. Illinois Institute of Technology is a combination of the Armour Institute of Technology (founded 1892) and the Lewis Institute (founded 1896). These institutes were merged in 1940. The enrollment is about 7,000. H.T.H.

ILLINOIS RIVER. This is the largest and the most important water route in Illinois. It makes up a large part of the waterway system that connects the Great Lakes with the Gulf of Mexico.

The river is formed by the meeting of the Kankakee and Des Plaines rivers about 45 miles southwest of Chicago. The Illinois flows southwest for about 500 miles and empties into the Mississippi River about 50 miles north of St. Louis. About 25,000 square miles of land is drained by the Illinois. The Illinois and Michigan Canal connects the river with the south branch of the Chicago River, and thus with Lake Michigan. The Illinois River is also connected with Lake Michigan by the Chicago Sanitary and Ship Canal, which is the waterway used by ships. The water level of the river

The Illinois River Winds Peacefully through the fertile farm lands of the state. It was over these same quiet waters that the early French explorers paddled their birch-bark canoes on their voyages to the Mississippi River.

was raised by the building of this canal, and towns along the river banks are often flooded. L.D.,Jr.

See also Chicago Sanitary and Ship Canal.

ILLINOIS STATE COLLEGE, EASTERN, is a state-supported coeducational school at Charleston, Ill. It was established primarily to train teachers, but also offers two-year preprofessional and general courses. Eastern State was founded in 1899. It has a normal enrollment of about 1,000.

ILLINOIS STATE NORMAL UNIVERSITY is a coeducational teacher-education school at Normal, Ill. Courses are offered in agriculture, art, biological science, business education, English, languages, geography, health and physical education, home economics, industrial arts, mathematics, music, physical science, psychology, social science, speech, elementary education, and special education. The university was founded in 1857 and has an average enrollment of about 2,000. G.M.H.

ILLINOIS STATE TEACHERS COLLEGE is the name of two accredited, publicly-supported, coeducational teacher-education schools.

Northern Illinois State Teachers College, at De Kalb, Ill., provides a four-year course leading to the degree of Bachelor of Science in Education. Northern also offers a general course on the junior-college level. The college was founded in 1895. Enrollment is about 1,000.

Western Illinois State Teachers College, at Macomb, Ill., gives courses leading to the Bachelor's and Master's degrees. Western offers general courses and work in fifteen preprofessional fields. The college was founded in 1899 and has a normal enrollment of about 1,500.

ILLINOIS WATERWAY. See Canal; Chicago Sanitary and Ship Canal.

ILLINOIS WESLEYAN UNIVERSITY is a coeducational liberal arts school at Bloomington, Ill. It is controlled by the Methodist Church. Courses are offered in the humanities, social science, and natural and physical science. A school of music is connected with the university. Students live in dormitories, fraternity and sorority houses, and approved homes. The university was founded in 1850 and has an average enrollment of about 800. R.D.

ILLITERACY, *il LIT er ah sih.* The United States Census Bureau in 1930 defined an illiterate as "any person ten years of age or over who is unable to read and write." This definition refers to the ability to read and write any language, not necessarily English.

But the ability merely to read and write is no longer considered enough to make a person truly literate. He must have enough education to be able to read, write and use numbers with some degree of skill in order to meet the demands of modern society.

Illiteracy in the United States. Federal statistics show that more than 7.7 per cent of all the people in the country were illiterate in 1910. The movement to get rid of illiteracy through education began in Kentucky in 1911. Alabama, Arkansas, Mississippi, South Carolina, and Georgia soon followed this lead. North Carolina and Oklahoma organized state-wide campaigns against illiteracy. Several other states selected certain backward counties to start with.

Conditions during World War I. When the United States entered World War I, the army found that about 700,000 young men could not write their names on their draft registration cards. This discovery led to the preparation of special books for illiterate soldiers. Many men received instruction at home, in training camps, and overseas. The movements to eliminate illiteracy continued to gain strength after the war.

National Campaign against Illiteracy. The need for a national organization to eliminate illiteracy had been stressed since about 1916. But no action was taken until 1926. Then a group of educators and other persons organized the National Illiteracy Crusade in Washington, D.C.

The Secretary of the Interior named the National Advisory Committee on Illiteracy in 1929, with the approval of President Hoover. This committee operated for three years in forty-four states.

By 1930, the number of illiterates dropped to 4.3 per cent of the population. This figure gave the United States ninth place among the nations of the world, a rise of one point since 1920. But illiteracy remained high in those sections of the country with large Negro, Indian, or Spanish-speaking populations or with a high percentage of immigrants.

A program to teach adult Indians was organized in 1931 with the co-operation of the Office of Indian Affairs.

Further progress against illiteracy was made through the Works Project Administration and the Civilian Conservation Corps. By 1941, the WPA had taught more than 1,500,000 adults how to read and write. Between 70,000 and 80,000 young men learned to do so through the efforts of the CCC.

The rapid decline of illiteracy caused the Census Bureau not to take statistics on this subject in 1940. Instead, they asked each person to state the highest grade he had completed in school. A person who had completed only the third or fourth grade in school might be assumed to be illiterate in a new sense.

But when the Selective Service law went into effect early in 1940, the army found that large numbers of men could not read and write well enough for military purposes. Those who had not finished the fourth grade were rejected at first. But when World War II was declared, the army set up a teaching program. About 90 per cent of the men enrolled in special classes for illiterates learned to read and write well enough to meet army requirements. Lack of time and teachers caused many thousands to be overlooked, however.

The fight against illiteracy has been greatly aided by various organizations. The most active of these have been the Department of Adult Education of the National Education Association, National Congress of Parents and Teachers, Rotary International, and the General Federation of Women's Clubs.

Yet the problem of illiteracy still remains before the nation. The closing or limiting of schools during the economic depression of the 1930's resulted in a new and large group of illiterates. Only forceful and continued action can wipe our illiteracy entirely.

State Efforts. A number of states received the names of their illiterates from the Bureau of the Census between 1914 and 1930. Then the new census law prohibited the furnishing of such information. Congress later amended this prohibition. The names of illiterates in each state are now released to proper school authorities.

Several states have made great progress against illiteracy. Alabama, Georgia, Louisiana, and South Carolina taught a quarter of a million illiterates from 1928 to 1930. Idaho and Wyoming have only a few thousand illiterates each. Iowa has the lowest percentage of illiteracy in the country. Some states have a rule that no prisoner shall be pardoned or paroled until he has learned to read and write.

Methods Used. Adults learn to write quickly by a special system in which they trace letters grooved in paper. Special books meet the needs of various classes of adult illiterates. The lessons are based on subjects related to his life and surroundings. For example, the farmer reads about improved methods of farming. The mother reads about baby care and foods for the family. Indians begin by reading about their own people.

The public receives information about the extent and effects of illiteracy through the press, through public discussions, and by other means. Illiteracy statistics are circulated so that persons can become aware of conditions within their own communities. Local campaigns and better laws have increased school attendance from 20 to 40 per cent in some communities.

In Canada. The number of illiterates in Ontario is about 6 per cent, the smallest percentage among the Canadian provinces. Prince Edward Island has about 7 per cent. Many literate people in Quebec read and write French, rather than English. The other provinces range from 8 to 12 per cent. The Northwest Territories have a mixed population composed largely of Indians and Eskimos. About 65 per cent of these people are illiterate.

In Other Parts of the World. About 50 per cent of the people of the world were unable to read and write in 1920, according to the United States Office of Education. But the condition varies widely from country to country. Iceland and Denmark have practically no illiterates at all. Illiteracy in Brazil is 71.2 per cent, in Egypt, 92.0 per cent, and in India, 90.5 per cent. M.A.C.

ILLUMINATING GAS is coal gas. When coal burns, it gives off a gas which is luminous. A Scotsman named William Murdock succeeded in lighting his home with this gas at about the end of the 1700's, and for a time it was used for street and home lighting. Coal gas and natural gas are used for cooking.

ILLUMINATION OF BOOKS AND MANUSCRIPTS. See ILLUSTRATION.

ILLUMINOMETER. See CANDLE POWER.

ILLUSION, *ih LYU zhun.* See PERCEPTION.

ILLUSTRATION is a painting, drawing, or photograph which accompanies the written part of a printed work. An illustration is most useful when it helps the reader understand the text. But it may serve merely to decorate or draw attention to the story.

The first illustrations were called *illuminations*. They were drawn by hand on manuscripts and consisted of elaborate initial letters, designs, and pictures. After movable type was invented, the first illustrated books were printed about 1461 in Bamberg, Germany. The printer was Albrecht Pfister. His illustrations were print-

ed from woodcuts, similar to modern blockprints. Often these early printed illustrations were colored by hand.

The woodcut was replaced in the late 1500's by engraving on copperplate. Since then, illustrations have followed closely the progress of typography, or printing by type. Today illustrations may be as complex and as colorful as literature demands. They are fully as artistic as were the hand illuminations of monks in the Middle Ages.

THE WORLD BOOK ENCYCLOPEDIA contains many types of illustrations. Brilliant color plates such as those with the article on DRESS are first painted by an artist. The pictures are reduced in size and printed from four halftone photo engravings. There is an engraved plate for each of the primary colors—red, yellow, and blue—and a plate for black. Other articles are illustrated with photographs or with drawings. Each portrays in its own way an important feature of the article it accompanies.

Another Meaning of the word *illustration* is as an example, in words, of what has already been stated. For example: "The speed of modern engraving is only one *illustration* of the progress in the printing trades." H.M.KU.

Related Subjects. The reader is also referred to:

Advertising (illustrations; Vocational Opportunities)
Art, Commercial
Caricature
Cartoon
Comics
Drawing (with list)
Engraving
Etching
Half Tone
Islamic Art (Books)
Lettering
Lithography
Offset
Photoengraving
Photography
Poster
Rotogravure
Woodcut

ILLUSTRATOR. See list of Cartoonists and Illustrators in the BIOGRAPHY section of the READING AND STUDY GUIDE.

ILLYRIA, *ih LIHR ih ah.* See ALBANIA (History and Government).

ILLYRICUM, *ih LIHR ih kum,* was the name of one of the four prefectures into which the Roman Empire was divided in the time of Diocletian (A.D. 245-313). Illyricum was also the name of a province in ancient Illyria.

ILMEN, *IL men,* **LAKE,** is a fresh-water lake in the Leningrad province of the Soviet Union. It is about twenty-five miles long and twenty miles wide. Three rivers, the Lovat, Msta, and Volkhov enter the lake. The Msta and the Volkhov are connected by a canal that runs along the northeastern shore of Lake Ilmen. This canal is part of the great waterway system that reaches from the Baltic Sea to the Black Sea. H.U.S.

ILOILO, *EE loh E loh.* See PHILIPPINE ISLANDS (Cities).

ILONGOT, *EE lohng GOHT.* See PHILIPPINE ISLANDS (The People).

IL TROVATORE, *eel TROH vah TO ray.* See OPERA (Some of the Famous Operas).

IMAGE. See ICON; IDOL.

IMAGE (in optics). See LENS; MIRROR.

IMAGINATION is the power of making mental pictures. The person who imagines puts together bits of his experience and creates images which are different from anything he has actually experienced with his senses. The process of imagination is different from remembering, which is simply recalling sights or sounds or other sense impressions in the form of images.

Some persons are much more imaginative than others. The introvert, or the person whose thoughts are chiefly turned inward, is usually more imaginative than the extrovert, whose thoughts and actions are turned outward, or bent on impressing and influencing others. To be successful, a person must keep a very clear sense of reality and be able to make practical use of his imaginings. When a person loses touch with the real world altogether and lives only in his imagination, he is mentally unbalanced, or insane.

Creative Imagination. Imagination which results in the creation of inventions or works of art is called *creative imagination.* Some artists see their paintings clear and bright in their mind's eye before they set brush to canvas. Creative imagination produced all the masterpieces of music, sculpture, literature, and the other arts. It also produced the wheel, the engine, the airplane, and all the other tools and machines we think of as important to the advance of civilization. Without creative imagination man would still be living more or less like animals do.

Passive Imagination. Hallucinations and daydreams are made up of imagined objects and happenings. The kind of imagination which produces daydreams is called *passive imagination.* Daydreams are a form of escape from reality. They allow the dreamer to leave the ordinary and sometimes painful world and imagine himself having very pleasant experiences.

People are often conquering heroes or brave, unflinching victims in their daydreams. They may see themselves acting before a great audience and receiving applause. Such daydreams sometimes arouse ambition and lead people to try to realize their dreams. At other times daydreams pass over into the processes of creative imagination. The person who makes up stories about himself may later make up stories which find their way into print. But it is harmful to rely too much upon the imagination for satisfaction and happiness. Imaginings may take the place of real living.

Imagination in Children. Imagination very early plays a part in the child's life. He soon begins to put bits of experience together into mental pictures and to weave a world of fancy in which he lives very happily. To him a stick is a horse, a bundle of rags is a baby, and his blocks are trains or boats. Many young children love myths and fairy tales because they fit in with the world of imagination. Little children find it hard to tell the difference between imagination and reality. Often they make statements which seem to adults to be lies or exaggerations. But children should not be scolded or punished for insisting that what they have imagined is true. They gradually learn, with the right kind of education, what imagination is and how it should be used. R.H.WHE.

See also HALLUCINATION; MEMORY; PERCEPTION; THOUGHT.

IMAGO is the fully developed insect which emerges from the pupa at the end of the third stage of insect life.

IMAM, *ih MAHM.* See OMAN.

IMBECILE, *IHM bee sil.* See DISEASE, MENTAL.

IMITATION. See WILL (in psychology).

IMMACULATA COLLEGE is a liberal arts school for women at Immaculata, Pa. It is operated by the Catholic Church. Courses are offered in languages, history,

literature, science, art, music, business administration, philosophy, and religion. Immaculata was founded as an academy in 1914 and became a college in 1920. The normal enrollment is about 300.

IMMACULATE, *ih MAC yu lit,* **CONCEPTION** is a doctrine of the Roman Catholic Church. It means that the Virgin Mary, in order to be pure enough to become the mother of Christ, was conceived free from the burden of original sin. Her soul was created in the purest holiness and innocence.

The doctrine of the Immaculate Conception was defined by Pope Pius IX on December 8, 1854. But even before this, the doctrine had been clearly understood and accepted by Catholic authorities.

The term is often confused among non-Catholics with the *Virgin Birth.* But this term has no connection with the Immaculate Conception. Mary had two human parents. The Virgin Birth implies a miracle, namely that Christ was "conceived by the Holy Ghost and born of the Virgin Mary." She had asked the angel Gabriel how she, a virgin, should become the mother of the promised Messiah, and she was told this would be by the power of God (Luke 1:34-38).

The Catholic Church has always strongly upheld these two articles of faith. F.J.S.

See also VIRGIN MARY.

IMMACULATE HEART COLLEGE is a school for women in Los Angeles, Calif. It is controlled by the Roman Catholic Church and conducted by the Sisters of the Immaculate Heart of Mary. It was established in 1906, and was recognized as a teacher-training institute in 1930. Besides the regular liberal arts course, it gives special training in the Catholic religion and philosophy. It has a normal enrollment of about 500. SR.M.E.

IMMERSION FOOT is a diseased condition of the lower limbs and feet. It is caused by prolonged exposure to extreme wet cold. Immersion foot is similar to, but more severe than, frostbite which results from exposure to dry cold. It also differs somewhat in the reaction of the tissues due to long contact with moisture as well as cold. Immersion foot frequently affected men who were cast into the North Atlantic from torpedoed vessels in World War II. Treatment consists largely in cleanliness, rest, and efforts to restore circulation. If gangrene develops, amputation may be necessary. See also FROSTBITE. P.R.C.

IMMIGRATION AND EMIGRATION. Migration is the movement of peoples from one continent, country, or region to another. A migrant is a person who leaves one place and goes to another. The community he leaves calls him an *emigrant,* and the region to which he travels calls him an *immigrant. Emigrate* means *to move out of. Immigrate* means *to move into.*

Whole tribes or races of people have taken part in some migrations, while others have been made up of individuals and families. One of the most important migrations of recent times was the movement of large numbers of people from farm areas to cities. The word *immigration* usually refers to the type of migration which began after the New World was discovered. Millions of people left their homes in Europe and Asia to come to the Americas and other newly discovered regions. They helped to develop these new lands and to form their populations.

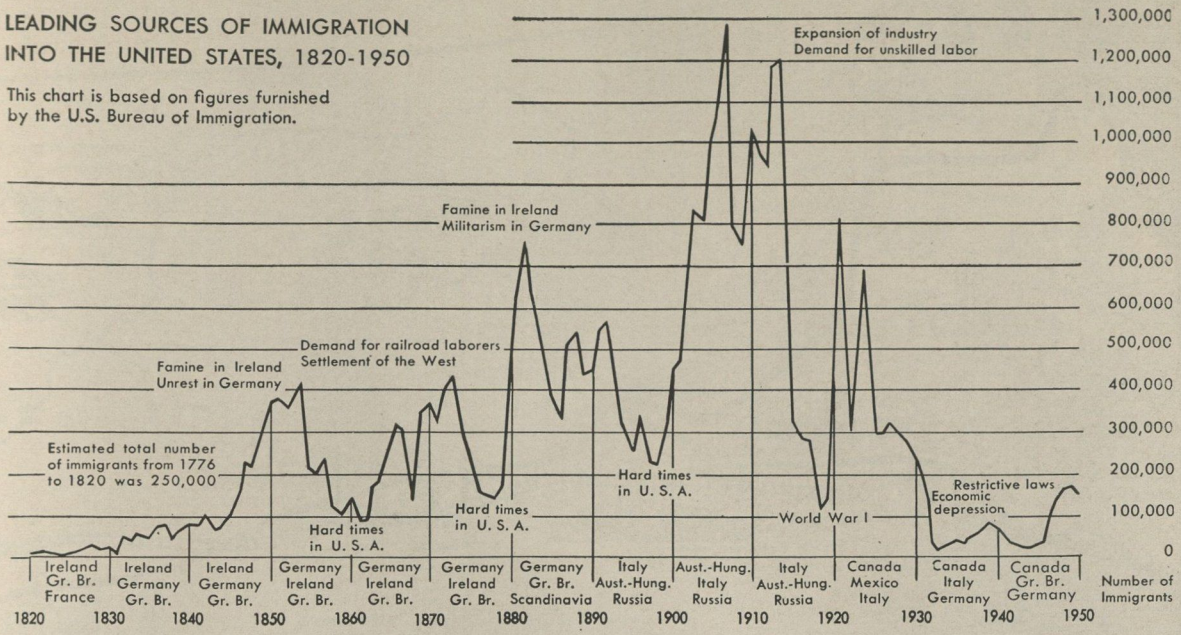
Early Migrations. Many migrations took place in the dim period before men began to write history. Paleolithic and Neolithic men roamed from place to place, seeking food and refuge. The brown-skinned Polynesians apparently left Asia and sailed their canoes to the Pacific islands. The ancestors of the American Indians are believed to have crossed from Asia to North America by way of Bering Strait. There were many other early migrations. Almost all races and groups of people were at some time migratory, or are descended from migrants. The Semites, Germans, Slavs, Huns, Arabs, Mongols, Turks, and Vikings all took part in great population movements. Invasion and conquest often went with migration. See MIGRATION.

Modern Migration. The voyages of discovery in the 1400's and 1500's revealed a whole new world, and a new movement of population began. At first immigration was not important as a way of colonizing the new lands. But as time went on, more and more people began to leave the European countries to seek a new life. One of the most recent chapters in the history of human migration is the story of the great waves of immigration which swept into the New World in the 1800's and 1900's.

About fifty million people left Europe between 1846 and 1924. This was the largest movement of population in human history. Statistics kept by the countries which received the most immigrants show that almost 62,000,000 persons entered those countries between the early 1800's and 1930. Nine tenths of these persons went to North and South America. The United States received more than three fifths of the total number, which amounts to about 38,000,000. Canada was second, taking in about 7,000,000 immigrants, and Argentina was third with more than 6,000,000. Most of the rest of the immigrants went to Brazil, Australia, New Zealand, and South Africa.

Most of the modern immigrants came from European countries. But many Chinese, Indians, and Japanese also left their homelands and sought a better way of life in other lands. Many of the Chinese migrants went to the countries of southeastern Asia — Burma, Siam, French Indo-China, Malaya, the East Indies, the Philippine Islands, and Formosa. In the 1800's the Chinese began to go to the non-Asiatic countries. The Indians migrated to Ceylon, Malaya, the East Indies, Mauritius, South Africa, and, to a much lesser extent than the Chinese, the countries of Europe and America. Japanese settlers went to Asiatic Russia, Hawaii, and the United States.

Causes of Modern Migration. Most emigrants leave their countries to seek a better standard of living for themselves and their families. Many also wish to escape political or religious oppression in their native lands. Migration decreases and increases at different times, according to conditions in the home countries and the receiving countries. Emigration from Europe to the United States increased greatly after 1847. This increase was caused by poor harvests in Europe, the potato famine in Ireland, and the tyrannical rule of the kings of Central Europe. These kings had tightened their hold on their countries following political disturbances and the failure of revolutions among their subjects. Immigration to the United States increased during times of prosperity in the



United States and fell off in the years of business depression and unemployment.

Emigration from Europe to the United States was stimulated in certain other ways. Letters from relatives who boasted about their new life made those at home want to cross the ocean and start a new life of their own. Agents of steamship lines and railroad companies gained business for their firms by spreading stories about the wonders of the United States. Employers who wanted plentiful, cheap labor, and landowners who wanted to sell their western lands also sent agents to Europe to "sell" America to immigrants. Throughout the world people heard that the United States was a free country, the "land of the second chance," where people could live unmolested and begin their lives anew.

Immigration into the United States

Sources of Immigration. Everyone in the United States, except the Indian, is either an immigrant or descended from immigrant stock. Some of our ancestors came sooner than others, but all came from other countries. Even in the early colonial period, the American people were a blend of many nationalities. In 1790 more than three fourths of the people were descendants of immigrants from England and northern Ireland. There were also many from Germany, southern Ireland, The Netherlands, France, and Switzerland. Americans worshipped as Protestants, Catholics, and Jews. The chart below shows the principal sources of immigration.

Principal Sources of Immigration to the United States, 1820-1943

Country	Total 124 Years
Germany	6,028,377
Italy	4,719,825
Ireland (Eire)	4,592,595
Great Britain	4,264,728
Austria-Hungary	4,144,366
Russia (U.S.S.R.)	3,343,480
Canada and Newfoundland	3,037,561
Sweden	1,218,229
Norway	805,367
Mexico	787,629
France	605,430
West Indies	465,569
Greece	431,279
Poland	415,949
China	383,420
Turkey	361,360
Denmark	335,453
Switzerland	297,763
Japan	277,944
Portugal	257,977
Netherlands, The	254,798
Spain	170,911
Belgium	160,487
Rumania	157,179
South America	125,200
Czechoslovakia	121,017

The Old Immigration. The population of the United States did not change greatly in nationality make-up between 1790 and 1840, for fewer than a million immigrants entered the country during this period. But 1,713,251 newcomers arrived in the ten years between 1840 and 1850. Most of them were from Germany and Ireland. Many of the Germans followed the pioneers westward. They joined other Europeans who were anxious to carve homes for themselves out of the wilderness.

Almost all the Irish settled in the cities. Most of them were employed as unskilled laborers. They helped to lay railroad tracks and build cities. The people who had come first often resented the Irish. Their customs and religion were different, they competed with workers already settled, and they were very active in politics.

The New Immigration. American industry needed more and more laborers in the period which followed

LUMBERING
Finns
SHEEPHERDING
English, Spaniards, and Mexicans
FARMING AND DAIRYING
Scandinavians
OREGON TRAIL
CALIFORNIA TRAIL
Chinese
TRANSCONTINENTAL
RAILROAD
Ogden
GOLD MINING
English, Scots, and others
OLD SPANISH TRAIL
SILVER MINING
Scots, Welsh
SUGAR-BEET RAISING
Mexicans and Russians
RAISIN GROWING
Armenians
TRUCK GARDENING
Japanese
Spaniards, Portuguese, Swiss, Italians, and Greeks
CITRUS-FRUIT GROWING
PONY EXPRESS
SPANISH MISSIONS
CATTLE RAISING
English, Mexicans, Scotch-Irish
SANTA FE TRAIL
ABILENE TRAIL
Early Spanish soldiers and explorers
HOW IMMIGRANTS HELPED TO BUILD THE UNITED STATES
These are only a few of the typical contributions made by the various national groups to American industry and culture

IRON MINING
Finns
CO-OPERATIVES
FARMING AND DAIRYING
Scandinavians, Poles, and Germans
Norwegians
ST. OLAF'S CHOIR
CHEESE MAKING
Danes and Swiss
FARM BELT
FARMING
Swedes, Germans, and Czechs
STOCKYARDS
Italians and Slavs
Dutch
FURNITURE MAKING
Slavs
BULB RAISING
Dutch
Slavs
STEEL AND RUBBER INDUSTRIES
CONESTOGA WAGONS
Germans
SYMPHONIC MUSIC
MARBLE QUARRYING
Italians
ERIE CANAL
Irish
STEEL MILLS
Poles
RUGMAKING
Armenians, Syria
STEEL INDUSTRY
Slavs
SWITZER BARN
Germans
COAL MINING
Welsh and Slavs
NARCISSUS-BULB GROWING
Dutch
LOG CABINS
Swedes
FUR TRADING
French
GYMNASTIC SOCIETIES
Germans
HORSE RAISING
Scotch-Irish
English
FOUNDING OF JAMESTOWN, 1607
English
TOBACCO BELT
Negroes
Scotch-Irish pioneers
NEGRO SPIRITUALS
FARMING
Italians
THEORIES AND SYSTEM OF GOVERNMENT
English
LAW
ORDER
COTTON BELT
Negroes
SUGAR-CANE GROWING
RICE GROWING
Negroes
MARDI GRAS
French
SPONGE FISHERIES
Greeks

the War between the States. During the last half of the 1800's, there was a change in the nationality of the immigrants. In 1882 about three fourths of the immigrants came from northern and western Europe. But by 1896, more than half of all the immigrants were coming from southern and eastern Europe. These new immigrants were referred to as "the new immigration," to point out their difference from "the old immigration" of people from northern and western Europe. By 1910 more than four fifths of the immigrants were "new."

Like the Irish before them the new immigrants found the hardest and most poorly paid jobs. Miners and mill hands were usually of English and Scottish parentage in the early 1800's. By 1850, Irishmen held these jobs, and by 1900 the new immigrant stocks had fallen heir to them. Many of the earlier immigrants were meanwhile able to improve their lot and advance to better jobs.

The new immigrants aroused hostility. They were even more different from the earlier Americans than the Irish and Germans had been. People who themselves had been immigrants not long before resented them bitterly. They said that the southern and eastern Europeans lived in miserable and unhealthful conditions. People did not always realize that many of these immigrants did not earn enough to be able to live decently. Persons who encouraged the immigrants to come to America and who made money from their labor were not interested in their education and well-being. The new immigrants were slow to adopt American ways, but they were no slower than earlier immigrants had been. The hostile attitude of the Americans made the Europeans cling even more closely to their own traditions.

Restriction of Immigration. The objection to immigration grew strong as organized labor began to grow in power. The Europeans and Asiatics accepted low wages and employers often hired them instead of American workers. On the Pacific Coast, labor demanded that Chinese immigration be stopped. A temporary measure ending Chinese immigration was passed in 1882, and in 1902 an act of Congress barred the Chinese permanently. Japanese immigration was stopped by a "gentleman's agreement" in 1907. Japan agreed to refuse passports to laborers who wanted to enter the United States. In 1924 Congress passed a law refusing admission to aliens who could not become American citizens. Both the Chinese and Japanese regarded this law as an insult.

European immigration continued with few restrictions during the early 1900's. Everyone could come except those who were diseased, insane, or undesirable in some other way. A law which refused admittance to people who could not read or write in at least one language was passed over President Wilson's veto in 1917.

After World War I. European immigrants rushed to America in great numbers at the close of World War I. But American industry no longer needed European workers, and the feeling against immigration had grown strong. Large numbers of the immigrants had taken sides with their native countries during the war. Many Americans felt that it was time to close the doors.

Congress began in 1921 to pass a series of laws which cut down the number of immigrants, especially those from central and eastern Europe. Nationalities of the old immigration were given preference. This was done by the *quota system*. The first quota law permitted each nation to send to the United States only 3 per cent of the number of persons of that nationality who were living here in 1910. The Johnson bill, which was passed by Congress in 1924, reduced the quota to 2 per cent. Only about 150,000 immigrants could be admitted in any one year. Each nation was allowed the same proportion of this number that it had in the 1920 population. Each quota country could send at least 100 immigrants each year, regardless of its quota. Asiatics were not admitted at all. No limitation was placed on immigration from countries of the Western Hemisphere.

The "national origins" law was put into effect in 1929. Provisions were made for the admittance of students, professors, and ministers, and of the foreign-born wives and children of United States citizens.

When the business depression of the 1930's began, fewer persons wanted to come to the United States. More persons left the country than entered it. The laws of the 1920's had ended the period of free immigration. No longer was America the traditional home for the poor and oppressed of all nations.

During and after World War II. A selected kind of immigration was permitted by the United States during the rise of Fascism in Europe and after World War II. Among early arrivals were such scientists as Albert Einstein and such writers as Thomas Mann, who fled to the United States to escape Nazi persecution. Immigrant scientists aided in the development of the atomic bomb, and remained to conduct peacetime atomic research. During the war, thousands of Mexican workers were permitted to enter the United States to aid in the production of food and war materials. Afterward, many refugees and displaced persons were allowed entrance into the country. In general, however, restrictions on immigration continued to be strictly enforced.

E.N.S.

Related Subjects. The reader is also referred to:

Alien
Americanization
California (The People)
Ellis Island
Flag (color plate, Official Flags of the United States [Immigration Service])
Naturalization
Oriental Exclusion Acts

SOME DISTINGUISHED IMMIGRANTS

Adamic, Louis
Agassiz, Louis
Antin, Mary
Audubon, John J.
Bell, Alexander Graham
Bemelmans, Ludwig
Bercovici, Konrad
Berliner, Emile
Bok, Edward
Carnegie, Andrew
Einstein, Albert
Ericsson, John
Gompers, Samuel
Hillman, Sidney
Lewisohn, Ludwig
Muir, John
Mukerji, Dhan Gopal
Noguchi, Hideyo
Patri, Angelo
Pulitzer, Joseph
Pupin, Michael Idvorsky
Riis, Jacob August
Rölvaag, Ole Edvart
Schurz, Carl
Shaw, Anna Howard
Steinmetz, Charles P.
Thomas, Theodore
Toscanini, Arturo

IMMORTALITY is the continued and eternal life of the human person after the death of the body. Belief in immortality has formed a part of almost every religion. The Greeks and Romans imagined life after death to be a kind of shadowy mirror of life on earth. The Jews believed that the good people would some day return to life and share in God's kingdom. The Christians

accepted this idea of resurrection and added the belief in a continued spiritual existence in Heaven. Like Christians, Moslems believe that people are rewarded or punished after they die. The Hindus and Buddhists think that souls are born again and again until the soul at last achieves eternal bliss. See also TRANSMIGRATION OF THE SOUL. A.E.H.

IMMORTALS, THE. See FRENCH ACADEMY.

IMMORTELLE, *IHM aur TEHL.* Immortelles are flowers which retain their natural form and color indefinitely after they have been dried. Immortelle is a name given to several species of plants which are related to the asters. They are the largest of the so-called *everlasting flowers.* The natural color of the immortelle is yellow. Besides being left yellow when they are dried the flowers are often bleached white, or dyed purple and red. In France two species of Xeranthemum are grown especially for funeral wreaths. See also EVERLASTING FLOWER. A.C.Ho.

Classification. These plants belong to the composite family, and the genus *Xeranthemum.* The species include *X. annum* and *X. braceatum.*

IMMOVABLE FEAST. See FEASTS AND FESTIVALS.

IMMUNITY is the condition in which a human being or animal is not susceptible to a disease. Certain substances called *antibodies* which are present in the blood stream make immunity possible. These antibodies are produced by the body, and fight or destroy bacteria and bacterial poisons which cause disease. Each type of antibody which is produced is effective only against one particular disease.

Immunity to a disease may be *natural* or *acquired.* Natural immunity is immunity with which a person or animal is born. Human beings are naturally immune to Texas cattle fever and many other diseases of animals while certain animals such as horses, cats, and dogs are naturally immune to tuberculosis, measles, and other diseases of man. There are, however, many degrees of natural immunity to certain diseases. Certain races or even families are more immune to a particular disease than are others. Certain peoples of the Orient are said to be more immune to tuberculosis, for example, than are Europeans.

Acquired immunity is the immunity which results from having had the disease or having been vaccinated against it. Acquired immunity may be *active* or *passive.* Active immunity is that in which the body of the immune person produces its own antibodies against the disease. This often results when the person has recovered from a disease. In such cases the body produces enough antibodies to protect it from another attack for a long time. Active immunity to a disease can also be produced by injecting small amounts of the killed bacteria or their weakened poisons into the body. Under such conditions the body produces antibodies which prevent the individual from getting the disease. This method of producing active immunity is called *vaccination.*

Passive immunity is an immunity which lasts only for a short while. It differs from active immunity in that the antibodies are not produced by the individual, but are produced by some animal or other person. The antibodies are then injected into the individual who needs them to help him fight the disease. In these cases blood serum donated by persons who have had the disease or the serum of certain animals which have been vaccinated against the disease is used. W.W.B.

See also ANTIBODY; INOCULATION; VACCINATION.

IMMUNOLOGY, *IM yu NAHL oh jih.* See BACTERIOLOGY.

IMPACT is the collision of two bodies which changes the velocity of the moving bodies. The momentum of a moving body is equal to its mass times its *speed.* One unit of momentum is equal to a mass of one pound that moves one foot in one second. If a metal ball weighing 2 pounds is thrown at a speed of 20 feet per second it strikes with an impact of 40 pounds. See also MASS; MOMENTUM. E.A.Fe.

IMPALA, *im PAH lah.* See ANTELOPE.

IMPEACHMENT. A government official is impeached when an authorized legislative body charges him with conduct unworthy of his office. The impeachment is only an accusation. The person impeached may continue to carry out the duties of his office until he has been tried and found guilty of the misconduct with which he was charged.

In the United States. The House of Representatives has the sole power to impeach an officer of the United States Government. A majority vote is required for impeachment. The United States Senate acts as a court to try Federal officials who have been impeached. When the Senate tries the impeachment of a President of the United States, the Chief Justice of the Supreme Court acts as presiding officer. The Constitution provides for this arrangement because the Vice-President, who generally presides over the Senate, would be the next President if the impeached President were found guilty. The Senate votes on the impeachment by roll call, and a two-thirds vote of those present is required for conviction.

In general, the states follow the same rules for impeachment that are followed by the national government. State officials are impeached by the lower house of the legislature, and are tried by the upper chamber.

In both state and Federal governments, the penalties imposed upon officers found guilty under impeachment charges may extend only to removal from office and disqualification from holding other offices. Even if the impeached person is found guilty of a crime, he can not be fined or sent to prison as a result of the impeachment trial. He may, however, be brought to trial for his crimes in a regular court of law.

The House of Representatives has voted articles of impeachment only thirteen times in the history of the United States. There have been only four convictions.

(1) William Blount, Senator from Tennessee, was impeached on July 7, 1797, for conspiring to wage war with Spain in favor of Great Britain, and for attempting to stir up the Cherokee Indians against Spain and the United States. His trial lasted from December 17, 1798, to January 14, 1799. The charges were dismissed for want of jurisdiction.

(2) John Pickering of New Hampshire, judge of the United States District Court, was impeached in 1803 for drunkenness and profanity on the bench, and for unlawful decisions. He was found guilty and removed from office.

(3) Samuel Chase, associate justice of the Supreme Court of the United States, was impeached in 1804 for injudicious actions and decisions in several political

M-G-M

A Scene during the Impeachment Trial of Andrew Johnson. This illustration is taken from the picture "Tennessee Johnson"

trials. He was acquitted in March, 1805.

(4) James Peck of Missouri, judge of the United States District Court, was impeached in 1830 for arbitrary conduct while trying a case. In January, 1831, he was acquitted.

(5) West H. Humphreys of Tennessee, judge of the District Court of the United States, was impeached in 1862 for giving support to the secession movement and unlawfully acting as judge of the Confederate District Court. He was found guilty and removed from office.

(6) Andrew Johnson, President of the United States, was impeached in 1868 for violating the Tenure of Office Act, for corrupt use of the veto power, interference at elections, and other high crimes and misdemeanors. His case came to trial on March 30 and ended on May 26. Thirty-five Senators voted him guilty, nineteen voted to acquit him. The votes were one short of the two thirds necessary to convict and he was therefore acquitted. See JOHNSON, ANDREW.

(7) William W. Belknap, Secretary of War of the United States, was impeached in 1876 for accepting bribes. He resigned and the charge was dropped.

(8) Charles Swayne of Florida, judge of the District Court of the United States, was impeached in 1904 for misconduct in office. He was acquitted.

(9) Robert W. Archbald, associate judge of the United States Commerce Court, was impeached in 1912 for entering into corrupt alliances with coal-mine owners and railroad officials while in office. In January, 1913, he was found guilty and removed from office.

(10) On June 12, 1914, District Judge Alston G. Dayton of West Virginia was impeached. Proceedings were dropped without trial, March 15, 1915.

(11) In April, 1926, District Judge George W. English (Illinois) was impeached for misdemeanors. He resigned before the trial.

(12) District Judge Harold Louderback of California was impeached, but was acquitted on May 24, 1933.

(13) District Judge Halsted L. Ritter of Florida was impeached and on April 17, 1936, removed from office.

In Great Britain and Canada. The House of Commons in Great Britain has the power to impeach officers of the government. The House of Lords tries the case. The most famous impeachment trial in British history was the trial of Warren Hastings, which lasted eight years. See HASTINGS, WARREN.

In Canada, The British North America Act gives the Dominion Parliament the right to impeach judges of the Superior Court. The Crown removes them from office if they are found guilty. H.CAI.

IMPEDANCE. See ELECTRICITY (Terms in Electricity).

IMPERATIVE MOOD. See MOOD.

IMPERATOR, *im peh RAY tawr*, is a title once given by the Romans to victorious military commanders. Early in Roman history, soldiers bestowed the title by raising the commander above their heads on a shield. The soldiers indicated in this way that they accepted the leader as their future commander in chief and would obey only him.

After the fall of the Republic, the Roman political rulers always took the title of imperator, from which the name *emperor* comes. The title of imperator gave to the ruler full command over all the armies of Rome. Modern rulers have also used the title. Examples are the kings of Great Britain and the former German emperor, William II. W.S.F.

IMPERIAL BUSHEL. See BUSHEL.

IMPERIAL CONFERENCE. See British Commonwealth of Nations; Newfoundland (History).

IMPERIAL DAM. See Arizona (Conservation).

IMPERIAL GALLON. See Gallon.

IMPERIALISM. A nation which extends its power by gaining control over other countries or their possessions is said to be imperialistic. Imperialism built all the great empires of the world. In modern times imperialism has been widely used as a way of gaining economic advantage, as well as establishing trade areas.

Many European countries built empires by establishing colonies in Africa, Asia, and the Americas. The colonies provided raw materials and new markets for the mother countries. High profits from cheap colonial labor were used to improve the living standards at home.

World War I was partly caused by imperialistic policies followed in Europe. Germany had not been as successful in acquiring colonies as some of the other countries. Therefore its leaders tried to build powerful armed forces and conquer other lands. The League of Nations was founded with the hope that such ambitions might be stopped. But it failed to prevent Italy, Japan, and Germany from seizing territory and bringing on World War II. Victors in this war created the United Nations to make the world more secure. But in a short time, the Soviet Union was forcing communistic governments on neighboring countries. Also, through its world-wide Communistic organization, the Soviet Union stirred up revolutions and wars in many parts of the world.

The treaty ports which existed in China for many years are a historic example of countries establishing trade areas by imperialism. Since China's government was weak, more powerful foreign countries demanded control of its best ports. This brought them high profits with little or no competition. See also Colony; Treaty Ports.

IMPERIAL MOTH. See Moth (Horned Caterpillar).

IMPERIAL ORDER OF THE DAUGHTERS OF THE EMPIRE. See Woman's Club (Canadian Clubs).

IMPERIAL VALLEY. This fertile farming region was once the southern end of the great Colorado Desert. Both nature and man worked to bring about the change from desert land to green valley. Most of the valley lies below sea level at the southeastern tip of California. It extends southward into Mexico near the Arizona border.

The Salton Sea lies in the northern part of the Imperial Valley. This ancient salt sea had dried up and remained dry until several floods during the 1890's, and water from the Colorado River in 1905 and 1906, again filled the basin. Today the sea, which lies about 240 feet below sea level, covers about 270 square miles.

An intake on the Colorado River at Imperial Dam, 300 miles below Boulder Dam, brought canals and irrigation ditches directly to the farms of Imperial Valley. About 500,000 acres of farm land have been irrigated.

The chief crops grown in the valley include lettuce, celery, cantaloupes, cotton, and alfalfa. There are also dairy farms in the valley and some beef cattle are raised. The most important cities and towns in the valley include Imperial, Brawley, Niland, Calexico, El Centro, and Holtville. See Salton Sea. E.L.Thu.

IMPETIGO, *im pee TI goh,* is a skin disease which most often affects children. It usually occurs on exposed parts of the skin such as the face. Blisters form on the skin and become filled with first a clear, then a cloudy, liquid. After the blisters burst, the liquid hardens into yellow crusts. Fluid often continues to ooze from the skin from

H. Armstrong Roberts

An Irrigating Ditch in the Imperial Valley of California is part of the system that changed wasteland into fertile farm land. This farmer is preparing to irrigate his carrot plants. When the low border of dirt is shoveled away, water will flow down the little trenches he has dug. This valley is now one of California's best farming areas.

beneath the crusts and causes more infection. Impetigo is a bacterial infection and is spread by contact with the patient or by towels and other articles the patient has used. Impetigo should be treated by a physician. Often powders containing boric acid and zinc oxide are helpful. P.R.C.

IMPLEMENT. See TOOL.

IMPLUVIUM, *im PLOO vih um.* See ATRIUM.

IMPORT. See EXPORTS AND IMPORTS.

IMPOST is a tax which is placed upon any kind of goods imported into the country from a foreign country. It is commonly called a customs duty. See CUSTOMS DUTIES; TARIFF.

IMPRESSIONISM. See FRENCH LITERATURE (1700 to Present); MANET, EDOUARD; MONET, CLAUDE; MUSIC (Impressionism); PAINTING (Late 1800's and Early 1900's).

IMPRESSMENT OF SEAMEN. See WAR OF 1812 (Causes).

IMPRISONMENT, FALSE. See FALSE IMPRISONMENT.

IMPROVED ORDER OF RED MEN. See RED MEN, IMPROVED ORDER OF.

INARCHING. See GRAFTING.

INBREEDING is the process in which closely related animals are mated. This is done to produce pure breeds of animals and to preserve good hereditary characteristics or get rid of bad ones. Inbreeding is the opposite of crossbreeding. Inbreeding causes hidden hereditary characteristics to appear in the offspring. If these characteristics are undesirable ones such as weakness, albinism, or feeble-mindedness, inbreeding may be undesirable among humans. It is often used scientifically by the animal breeder, however, to produce and select offspring of certain desirable types. Such animals are then used to build up strains of superior excellence. These strains may be kept pure, but are also often crossed with other stocks. Inbreeding over very long periods may produce a loss of vigor in the offspring. G.W.BE.

INCA, *ING kah.* A tribe of early Quechua Indians who lived in the mountains of Peru were ruled by a succession of wise and powerful leaders. Each ruler would name the most able of his sons as his successor. The ruler was called the *ynca,* which meant *prince* in the Quechuan language. The name *Inca* is now used to mean not only the leaders, but also all the members of the tribe.

The Incas built up a great empire and an advanced civilization which spread over much of western South America. The armies of the Spanish invaders conquered the Incas during the 1500's. But not all the members of the tribe were killed. Many of their descendants still live on the plateaus of Peru, Bolivia, and Ecuador.

The early history of the Incas is found only in legends, and is uncertain. But history shows that after about the year 1200 the Incas conquered other Indian tribes and spread Incan rule and civilization far beyond their native Peruvian mountains. The Incas prevented revolts in the lands of their conquests by moving groups of conquered people from their homes into regions which were already well controlled. People known to be loyal to the Incas were sent to the conquered regions.

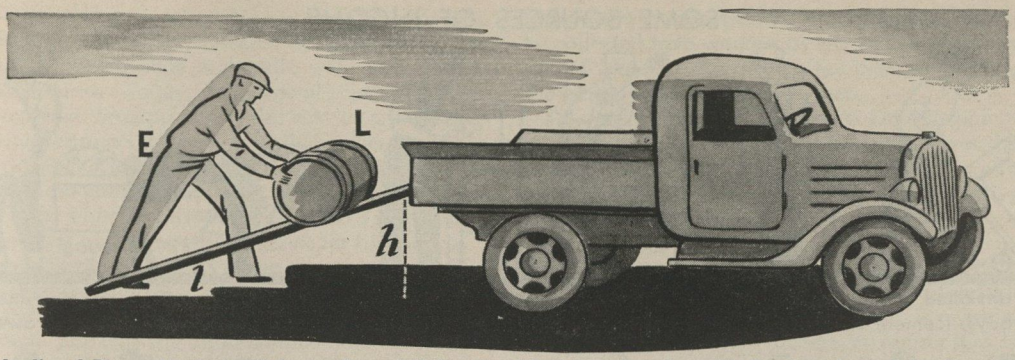
The Inca empire was a perfect example of state socialism. The life of every citizen was regulated from the time he was born until he died. The ruling Inca had absolute power. His orders were carried out by a series of officials. The Inca system of government provided great prosperity, but it prevented the average Indian from developing self-reliance. When Pizarro suddenly landed with a handful of men in 1534 and seized the Inca, Atahualpa, the people of the tribe were helpless.

Inca Civilization. The Inca capital was at Cuzco, in Peru. A network of roads spread from the capital over the whole empire. Relays of swift runners carried messages and commands from the ruler to the governors of the provinces. The Incas built great irrigation systems. They constructed granaries for storing food. When crops failed in a region, food was taken from the granaries and distributed. Industries of all kinds were encouraged.

The Incas wove beautiful textiles from cotton and from wool of the alpaca and vicuña. They mixed copper with tin and made weapons and tools of bronze. They

American Museum of Natural History

Native Art from the Land of the Incas. At the left is a headdress with a brilliant design of colored feathers. The people of the Inca empire were noted for their featherwork. At the right are two wooden jars with symbolic designs.



The Inclined Plane Made by Using a Board Helps the Workman Load on His Truck a Barrel He Cannot Lift

adorned their temples with enormous amounts of silver and gold. The great Temple of the Sun at Cuzco was perhaps the finest of their buildings.

Unlike the Maya Indians, the Incas never developed a system of writing. They kept accounts and records by means of bunches of strings called *quipus*. The colors of the strands and number and kind of knots had different meanings. The Incas knew how to make use of huge blocks of stone in building. These stone blocks often weighed many tons. They were cut and fitted together without mortar or any other binding material. The joints are so perfect that a knife blade will not slide into the spaces between blocks. Examples of this work can still be seen at Cuzco and Machu Picchu. A.V.K.

Related Subjects. The reader is also referred to:

Aborigine
Atahualpa
Dress (color plate, Latin America)
Funeral Customs (Burial)
Indian, American (color plate, Inca Indians)
Latin-American History (illustration, Inca Civilization)
Peru
Pizarro, Francisco
Races of Man (color plate, American Indians)

INCANDESCENT, *IN kan DES ent*, **LIGHT.** See ELECTRIC LIGHT.

INCANTATION. See MAGIC.

INCARNATE WORD COLLEGE is a liberal arts college for women at San Antonio, Tex. It is operated by the Sisters of Charity of the Incarnate Word. Courses are offered in the arts, music, home economics, nursing, nursing education, and public health nursing. The college was chartered in 1881. Enrollment is about 260. SR.M.C.

INCENSE is a mixture of sweet-smelling gums and balsams. It burns with a delicate fragrance. Sandalwood and other substances are sometimes added to produce certain scents. Usually incense is made in powder form or in sticks. The ancient Egyptians burned incense at religious ceremonies. The Greeks and Romans and later the early Christians adopted this practice. The burning of incense is still an essential part of the ritual of the Greek Orthodox Church, the Roman Catholic Church, and some Episcopalian churches. Buddhists also burn incense at religious ceremonies. Incense is often burned in the home to give fragrance to a room, or to mask an unpleasant odor, such as that of the antiseptics which are in a sickroom. F.E.WA.

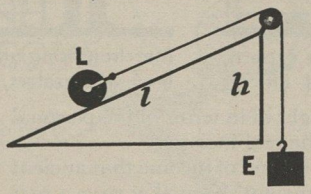
INCH. An inch is the smallest unit of distance in the English system of measurement. There are twelve inches in a foot and thirty-six inches in a yard. Any distance smaller than an inch is measured in fractions or decimal fractions of an inch. The English inch is equal to 2.54 centimeters. Its length was determined by law during the reign of Edward II. As the inch is the smallest common unit, it is often used to indicate very slow progress. See also WEIGHTS AND MEASURES. E.G.ST.

INCHCAPE ROCK. Many years ago bells were put on this dangerous reef in Scotland to warn sailors away from it. Inchcape Rock is still often called Bell Rock. It extends about half a mile along the eastern coast of Scotland, and stretches southward from the city of Arbroath past the Firth of Tay and the Firth of Forth. At low tide the reef offers a barrier to shipping. H.U.S.

INCIDENCE, ANGLE OF. See LIGHT (Behavior of Light); REFLECTION.

INCISOR, *in SI zer*. See TEETH.

INCLINED PLANE. An inclined plane is one of the six simple machines. It is used to move heavy loads with relatively small forces. For example, when a load is pushed up a slanting platform into a truck, less force is needed than if the load is simply lifted into the truck. The reason is that the load travels farther. Suppose the truck is $3\frac{1}{2}$ feet high and the load is a 200-pound barrel of molasses. The work done is the weight times the distance, or 200 times $3\frac{1}{2}$, which equals 700 foot-pounds of work. If the barrel is rolled up a 14-foot plank, it moves 14 feet to do 700 foot-pounds of work. Therefore the force required is only 50 pounds, or 700 divided by 14. The longer the plank the easier it is to do the work. A highway winding up a hillside is also an inclined plane. See also WEDGE. R.F.P.



The Inclined Plane makes it possible to raise a heavy weight much more easily.

INCLINOMETER, *IN klih NAHM ee ter*, is a simple device for measuring the angle between the horizontal and an inclined surface. It is often used by geologists and civil engineers. On ships it is used as a roll indicator.

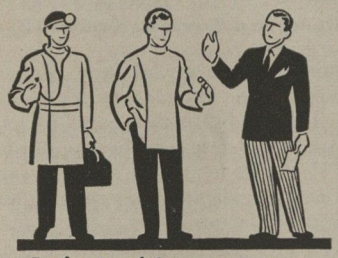
INCOME is that which we receive in return for our goods or services. Income may be thought of in three ways. It may be thought of as money. This is called pecuniary or monetary income. It may be thought of as goods and services received, and be called real in-

SOME SOURCES OF INCOME

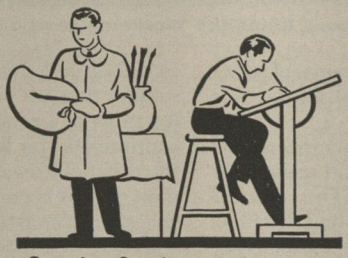
Unskilled Labor. Delivery boys, icemen, shovellers

Skilled Labor. Blacksmiths, machinists, plumbers, bricklayers

Agriculture. Farmers, dairymen, stock raisers, vegetable growers

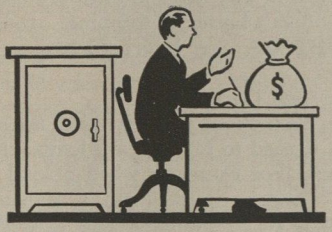


Professional Services. Doctors, dentists, lawyers, accountants



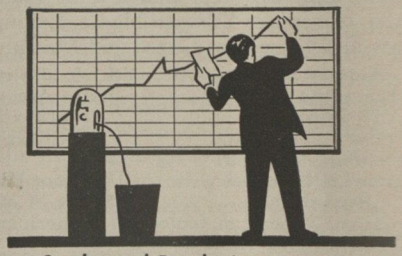
Creative Services. Artists, engineers, musicians, designers

Personal Services. Barbers, maids, gardeners, chauffeurs



Banking Services. Loan experts, financial advisers, trust officers

Merchandising and Selling. Salesmen, wholesalers, storekeepers



Stocks and Bonds. Investment counsellors, market analysts

come. And it may be thought of in terms of the personal satisfaction gained from the real income.

Real Income was the only kind of income that ancient people knew about. The ancient shoemaker gave a pair of shoes to the goat herder in exchange for a month's supply of milk. The blacksmith made a lock and key for his customer who paid him by giving him a cask of wine. Eventually this exchange was put on a larger scale at markets and fairs. Farmers brought animals and farm products to market. City tradesmen brought their wares to the same place. The farmer went home with a length of cloth or a soup kettle. The city tradesman went home with enough food to last him for some time. This was their income. It was what each received in exchange for his own labor.

The introduction of money changed the ideas of income. Instead of taking a carload of goods to the store, we now need carry only a handful of money. Today the worker receives as his income a wage or salary of so many dollars and cents. He spends some of these dollars at the butcher shop. Thus the butcher gets his wage in dollars and cents, and the purchaser does not have to carry large bulky objects to trade.

Real income today is counted in terms of goods such as a home, good food, warm clothing, and little luxuries. It is also counted in terms of services like a surgical operation, the use of a telephone, the work done by a maid, or a streetcar ride.

Personal Satisfaction is another way of looking at income, but it cannot be measured. A house is no good to a man unless he lives in it and gets warmth and comfort from it. A chair is no good unless it is used.

Thus, income is also the satisfaction of wearing a pretty dress, of listening to the radio, of driving a car through the country in autumn, and of owning good books and eating good food.

Pecuniary Income is the kind that most people think of. At the end of a year every business must total its income for the year. This income is written in dollars and cents. The businessman must total his money receipts for the year. He subtracts from this the cost of the raw products used in his manufacture, or the wholesale cost of the goods which he stocks in his store. The result is his gross income. From this he subtracts his own operating expenses for the year. This includes costs of labor, property, advertising, depreciation, and so forth. The

amount remaining is called his net income, or profit.

Real income is strongly affected by science and technology. The automobile and radio were once looked upon as luxuries. Today, advances of science and engineering have brought down the cost of automobiles and radios. Farmers have lowered their costs of production by using scientific methods of agriculture. The result of these changes has been to lower the prices of many goods. This has raised the consumer's real income by permitting him to buy more goods for his money.

Income Distribution refers to the way the national income is divided among the people. The national income is the total income of all individuals, plus the net income of business. The way the national income is distributed greatly affects the welfare of a country. If a great proportion of the people get a very small share of the national income, their living standards are lowered, their health is endangered, and they cannot buy the products of industry. F.A.Br.

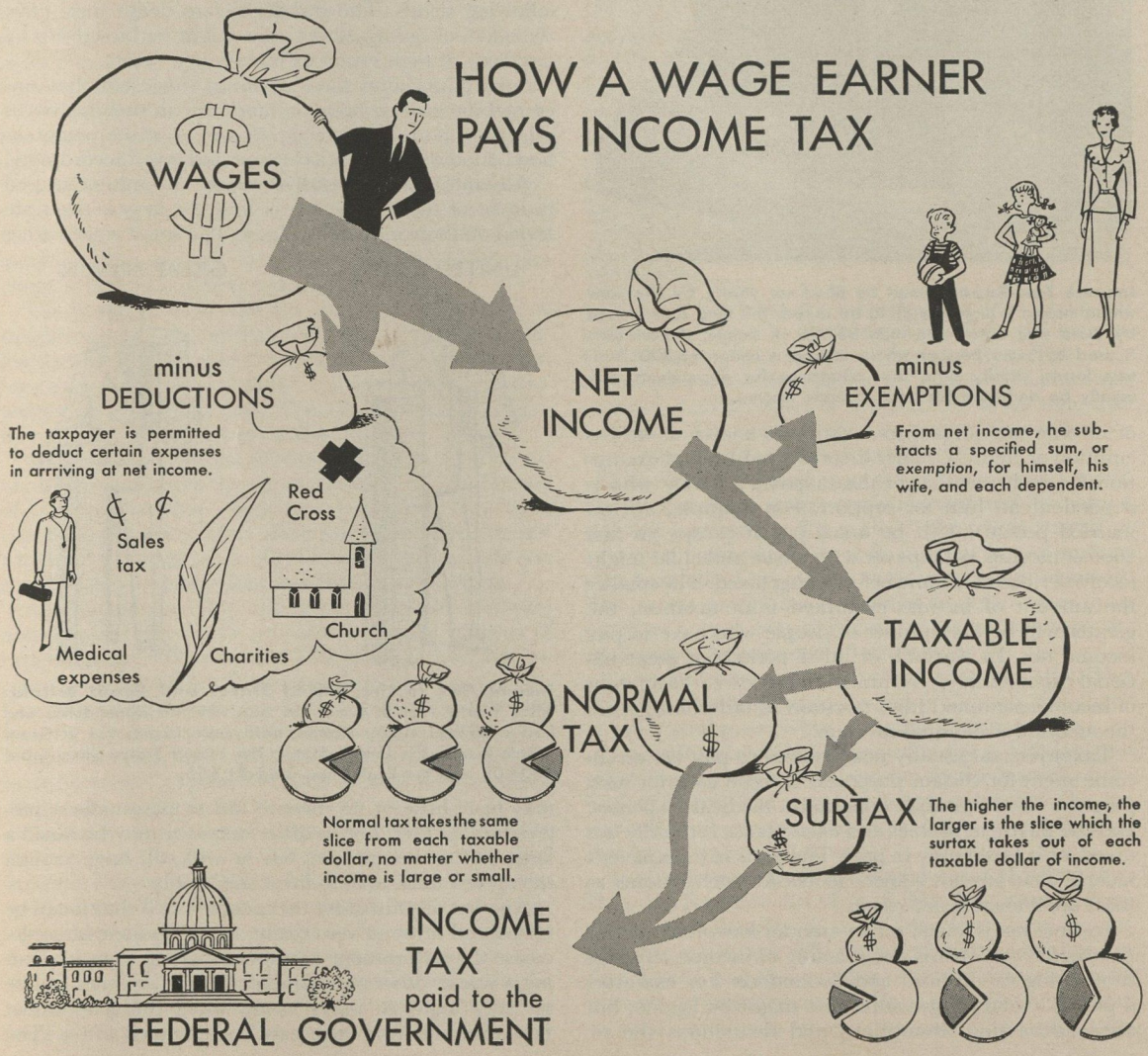
See also Budget; Budget, Household.

INCOME TAX. A tax levied on incomes may be collected directly from persons or corporations. It may also be collected from workers by the employer, and sent to the government. An income tax taken out of wages by the employer is a *withholding tax*.

In most countries, the tax on a large income takes a much larger share of what a person receives than the tax on a low income takes. For example, a wealthy person may be taxed $80 for every $100 he receives. A person of low income may be taxed no more than $5, or perhaps nothing at all, for every $100 of income. This kind of income tax is called a *progressive tax*. The rate of taxation becomes higher as the income increases.

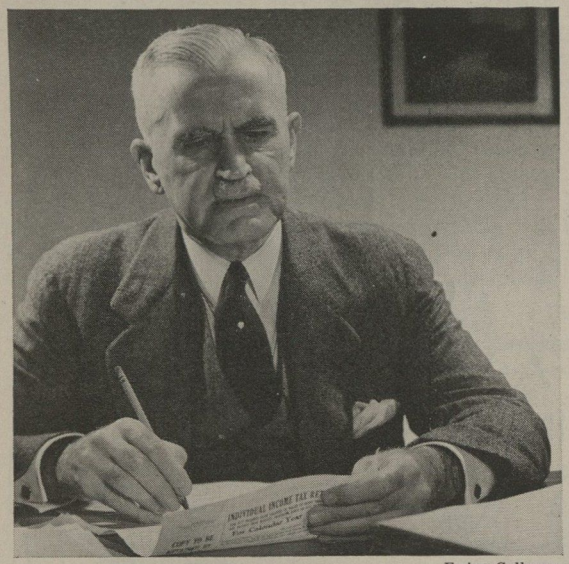
Another way of levying income tax is to tax a fixed proportion of everyone's income, no matter how large or small the income. With this kind of tax, everyone might pay, for example, $5 from every $100 of income. An income tax of this kind is called a *proportional tax*.

In the United States, the income tax is both progressive and proportional. The proportional part of the levy is called the normal tax. The progressive part of the levy is called the surtax, which means *extra tax*. The



surtax is levied on the smaller incomes only when the Government is badly in need of money. The surtax rate increases rapidly as incomes increase in size. On incomes of very high-salaried people the surtax has sometimes amounted to as much as 90 per cent of the income. Corporations as well as individuals pay both normal taxes and surtaxes.

In most countries that have an income tax, the income below a certain amount is not taxed. The amount



Ewing Galloway

Income Tax Reports must be filled out yearly by everyone whose income is high enough to be taxed. This long form is used by those who earn more than $5,000. A simple, shorter form is used by some persons whose income is under $5,000. Business losses, charity gifts, and allowance for dependents may usually be deducted from the taxable income.

of income not subject to taxation is known as an exemption or credit. Usually there is an additional exemption for each member of the taxpayer's family who is dependent on him for support. For example, an unmarried person might be taxed on all except his first $600 of income. A taxpayer with a wife and child might receive $1,800 of income before being taxed. The smaller the amount of income exempted from taxation, the greater will be the number of people who have to pay income tax. In wartime or other periods of great national expenditure, governments often lower the amount of income exempted from taxation in order to increase the amount of national revenue.

Taxpayers are usually not required to pay tax on income spent for certain purposes. Income used for such purposes as charitable donations, medical expenses, and the payment of sales and excise taxes is usually not taxed, or is taxed only in part. The parts of a taxpayer's income that are not subject to tax for such reasons as these are known as *deductions*.

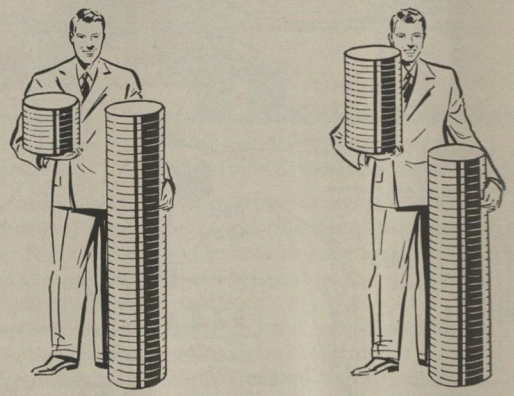
Income tax is levied on an amount known as the *net taxable income*. This is the amount of income left after subtracting exemptions and deductions. For example, a person's total (or gross) income might be $3,000, but after subtracting exemptions and deductions the remainder might be no more than $1,000. The $1,000 would be the net taxable income and the amount on which he would pay tax.

Estate, Inheritance, and Gift Taxes are also types of income taxes. The estate tax is a tax levied on a person's estate after his death. This tax is very high if the estate is of great value. As much as 77 per cent of the portion of a net estate in excess of $10,000,000 could be taxed in 1950. But exemptions were allowed, especially for married persons. An individual is permitted to give away $30,000 during his lifetime. Above that amount, except for certain exemptions, taxes are levied on gifts of money or property made by the owner before his death. The gift tax in the United States is about three fourths as high as the estate tax. Inheritance taxes are levied on persons who inherit sums of money above a certain amount.

Sometimes an individual can avoid the payment of inheritance or estate taxes by transferring property while he is still alive. Even if gift taxes must be paid on this transferred property, they are still lower than taxes following death. The transfer before death may have the effect of saving estates that might be broken up by payment of high estate or inheritance taxes.

Some authorities have at times suggested that unearned increase of value on land, due to such factors as growth of population or development of the neighborhood, should be treated as income and taxed accordingly.

Advantages and Disadvantages. An argument used in favor of the income tax is that the largest taxes are levied on those most able to pay. The small wage-earner



Income Tax in the United States and Great Britain. After World War II, a married man with two dependents, who had a $5,000 yearly income, paid more income tax in Great Britain than in the United States. The United States citizen paid $804.08 and the Englishman paid $1,655.

may have little or no income tax to pay under a progressive tax law. The wealthy taxpayer may be taxed a large part of his income, but he will still have enough money left to be able to live comfortably.

Another argument for the income tax is that it can be raised and lowered very easily, and thus increase or decrease the government revenue according to need. During a war or other national emergency, the rates can be set very high. At other times, when the government needs less money, rates can be set much lower. The

United States Congress makes frequent use of this feature of the income tax. It changes the tax rate very often. Fifteen important changes were made in the income tax law between 1913 and 1941, and since 1941 the law has been changed almost every year.

A disadvantage of the income tax is that it is harder to collect than property or excise taxes. People sometimes conceal part of their income from the government. The tax collectors therefore cannot collect taxes on all the income received by these persons. This is unfair to those persons who pay the proper amount of tax. It reduces the amount of money collected, and may keep the tax rate higher than it would need to be.

People have sometimes argued that the progressive income tax hurts business. They say that high tax rates on large incomes discourage the wealthy from starting new businesses. The idea is that wealthy persons will not invest in new businesses because they fear the income tax would take most of the profits away from them. Other persons have argued that the progressive income tax is good for business. They base this argument on the fact that a progressive tax takes little money away from the poor. People with low incomes therefore have more money to spend. The more they have to spend, the better the market is for businessmen who have things to sell.

The progressive income tax is preferred to other taxes by most persons even though there are arguments against it. Opponents also criticize this type of tax because it offers no principle for determining the *degree of progression*, that is, whether the tax increase should be moderate or steep as it reaches the various higher incomes. The greater the degree of progression, the closer is the approach to equality of income.

The progressive income tax can serve as a means of transferring income from the wealthy to those who are less fortunate. This happens whenever the government uses money collected through the income tax for purposes that benefit the poor. Persons use this as an argument either for the tax or against it.

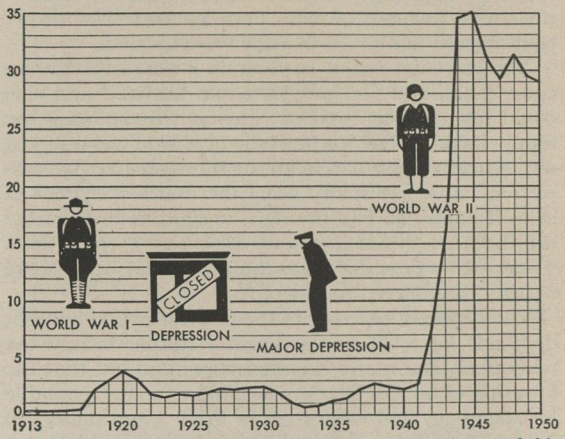
In the United States. Income tax, like all Federal taxes except import duties, is collected by the Bureau of Internal Revenue. Many income tax laws have been passed by Congress. Most of the laws have been complicated. The tax rates in the following paragraphs are correct for most taxpayers, but not for all of them.

As long ago as 1815, the Secretary of the Treasury asked unsuccessfully for an income tax as a means of raising money to pay for the War of 1812. The first income tax was effective between 1863 and 1873. In 1894 Congress again passed an income tax law. Nine months later the Supreme Court ruled the law unconstitutional.

The Sixteenth Amendment, which was adopted early in 1913, gave Congress the right to levy income taxes. An income tax law was passed the same year. It provided for a normal tax of 1 per cent on incomes, up to $20,000, and placed a surtax on incomes of more than $20,000. During World War I the income tax was greatly increased. The normal tax ranged from 6 to 12 per cent and the surtax was as high as 65 per cent on large incomes. Income taxes were lowered in 1924.

The income tax remained low until World War II, when the government again found it necessary to raise large sums of money by taxation. The first two wartime

RISE AND FALL OF INCOME AND PROFITS TAXES
IN BILLIONS OF DOLLARS



Based on Government Statistics
PICTOGRAPH CORPORATION

tax laws were passed in 1940. The first law set the normal tax at 4 per cent. A surtax was placed on incomes of $4,000 or more. The surtax began at 4 per cent and increased to 75 per cent on net incomes of more than $5,000,000. The law provided for a defense tax amounting to 10 per cent of the normal tax, as well as surtaxes on all net incomes up to $180,000. Corporations paid a normal tax ranging from 13 to 24 per cent.

The second Revenue Act of 1940 levied a tax on excess profits made by corporations. This tax ranged from 25 to 50 per cent.

Another Revenue Act was passed in 1941. This Act raised taxes again by lowering exemptions and increasing the surtax. The surtax now ranged from 6 per cent on incomes of less than $2,000 to 77 per cent on incomes of more than $5,000,000. Corporation taxes were also increased. The excess profits tax reached 60 per cent for corporations with very high profits.

The Revenue Act of 1942 raised the income tax still higher. Exemptions were again lowered and the normal tax was increased to 6 per cent. The surtax started at 13 per cent and ranged up to 82 per cent on any amount over $200,000. Corporation taxes were again increased. The excess profits tax amounted in some cases to as much as 90 per cent of excess profits, of which 10 per cent was to be refunded after the war.

In 1943, Congress passed a "pay-as-you-go" tax. This was a withholding tax deducted from each pay check of every person receiving a regular salary or wage.

A new Revenue Act was passed in 1944. This law provided for the highest income tax in the history of the United States. The surtax on net incomes under $2,000 was set at 20 per cent and increased to 91 per cent on any amount over $200,000.

Income taxes were lowered at the end of World War II by the Revenue Act of 1945. The new rates became effective on January 1, 1946. The normal tax was reduced to 3 per cent. The surtax on net incomes of less than $2,000 was set at 17 per cent and decreased to 88 per cent on any amount over $200,000. The normal tax on corporations was set at 24 per cent. The corporation

surtax was 6 per cent for corporations with incomes of less than $25,000 and rose to 14 per cent for corporations with incomes of more than $50,000. The 10 per cent defense tax levied in 1941 was repealed.

The Revenue Act of 1948 again lowered Federal income taxes, and also provided that husband and wife could reduce their total tax payment by splitting the family income. The split-income provision was adopted to put heads of families in all the states on an equal taxpaying basis. For many years the married citizens of certain states had had the right to claim a lower surtax rate because their states had *community property laws*. These laws provided that husband and wife share equally in property and income.

The high cost of living in the postwar period brought demands for relief in the form of further income-tax reductions. But many economists pointed out that the lowering of income taxes makes more money available for spending, and causes prices to go even higher. In 1950 and again in 1951, the Federal Government felt it necessary to pass revenue acts which brought substantial raises in income tax rates.

State Income Taxes. Many states also have income taxes. The first successful state income tax was adopted by Wisconsin in 1911. More than thirty of the states, and the District of Columbia, now tax personal income. Many states also have inheritance and gift taxes.

In Other Countries. The modern type of income taxes first came into general use near the end of the 1800's. Great Britain levied an income tax between 1799 and 1816 to help pay the cost of the Napoleonic wars. In 1842 England again adopted an income tax and has had one ever since. At present, the income tax is the largest single source of revenue in Great Britain.

More than fifty other countries have adopted income taxes. These include Australia, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Norway, Spain, Sweden, Switzerland, and The Netherlands. Rates of income taxation are much higher in most foreign countries than in the United States. M.P.H.

See also RUML, BEARDSLEY; TAX COURT OF THE UNITED STATES.

Questions

What is meant by: (a) withholding tax, (b) progressive tax, (c) proportional tax?

What is the difference between normal tax and surtax in the United States?

What is the difference between an exemption and a deduction?

What taxes are also types of income taxes besides those on regular earnings or income?

When were income taxes first levied in the U.S.?

Which amendment gives Congress the power to levy income taxes?

INCUBATION, *IN kyu BA shun*, is the process in which eggs, bacteria, protozoa, and other living organisms are kept at the proper temperatures for growth and development. Incubation of bacteria, for example, is usually carried on at a temperature of 37.5° C. The apparatus used to maintain this temperature is called an incubator.

Incubation of the eggs of birds is normally carried out by the female bird, who sits on them to keep them warm. The temperature usually necessary for the development of the young bird is about 103° F. to 104° F. The hen's egg requires an incubation of about twenty-one days; the duck's, twenty-eight days; and the turkey's, thirty days. G.W.BE.

INCUBATOR, *IN kyu BAY ter.* An incubator hatches poultry eggs by heating them. A simple incubator is a large box with glass windows at the front, and trays inside to hold the eggs. As soon as the chicks hatch, they go toward the light in the front of the incubator. When they reach the edge of the tray, they fall to the lower part of the incubator. Then the chicks can be taken out by sliding out the lower tray.

The heat and ventilation inside the incubator must be controlled with great care. For the first two days the temperature around the trays is kept at about 102° F.

U.S.D.A.

In Modern Incubators, eggs can be hatched with much less trouble and expense than when brooding hens are used.

Then the temperature is raised to 103° F. From the third day until two days before the eggs hatch, the operator turns the eggs twice each day to make sure they are heated the same on all sides. The incubator is kept in a room which has no dampness or drafts, and the operator is careful not to jar or shake the machine.

In large commercial hatcheries, each incubator can hatch thousands of eggs. These are usually heated by a hot-water pipe system or by electricity. R.R.BI.

INCUNABULA, *IN kyoo NAB yoo lah.* See BOOK (Printed Books).

INCUS, *ING kus.* See EAR (Middle Ear).

INDEFINITE PRONOUN. See PRONOUN.

INDEPENDENCE, Mo. (population 36,963). Once this city was famous as one of the most important supply posts along the Santa Fe and Oregon Trails. Today, Independence is chiefly a residential center. Many of its people work in Kansas City, ten miles to the west. The city is noted as the home of Harry S. Truman, thirty-third President of the United States.

Daniel Morgan Boone, son of the pioneer Daniel Boone, was one of the early white settlers in this region. The Mormons settled in Independence in the 1830's, but after a few years they were driven out by other settlers. The first mail stagecoach lines to the Far West were started at Independence in 1846.

During the gold rush of 1849, stagecoaches stopped at Independence on their way to California. The city was the scene of bitter fighting during the War between the States. Twice it was captured by Confederate troops. But each time they held it for only one day.

After the war, Kansas City became the great market for this region, and Independence grew less important as a trading center. R.Sc.

INDEPENDENCE, DECLARATION OF. See DECLARATION OF INDEPENDENCE.

INDEPENDENCE DAY is the birthday of the United States of America. It is celebrated on July 4 each year in all states and territories of the United States. Independence Day is the anniversary of the day on which the Declaration of Independence was adopted by the Continental Congress — July 4, 1776.

The founders of the new nation considered Independence Day an important occasion for rejoicing. John Adams said, "I am apt to believe that it will be celebrated by succeeding generations as the great anniversary festival. It ought to be commemorated as the day of deliverance, by solemn acts of devotion to God Almighty. It ought to be solemnized with pomp and parade, with shows, games, sports, guns, bells, bonfires, and illuminations, from one end of this continent to the other, from this time forward for evermore." Independence Day was first observed in Philadelphia on July 8, 1776. The Declaration was read, bells were rung, bands played, and the people rejoiced. Independence Day has been celebrated throughout the country from that day to the present. It is also celebrated in the territories of the United States. In 1941, Congress declared July 4 a legal public holiday. Banks and business houses are closed and people celebrate with sports, picnics, and fireworks. See HOLIDAY.

Early Independence Days were occasions for shows, games, sports, military music, and fireworks. Fireworks and the firing of guns and cannon caused hundreds of deaths and thousands of injuries each year. In the early 1900's, many people began to plead for a "safe and sane Fourth." As a result, many cities and several states passed laws forbidding the sale of fireworks. Some cities permitted fireworks, but hired trained men to explode them at a community celebration in the evening. Many persons could enjoy the fireworks, and there was less danger of personal injury. Communities began to stress the patriotic nature of the holiday. At present, the day is marked by programs and pageants, games and plays, athletic contests, and picnics. E.H.Se.

INDEPENDENCE HALL. See PHILADELPHIA (Interesting Places to Visit).

INDEPENDENT. See VOTING.

INDEPENDENT ORDER. Many Independent Orders are listed in THE WORLD BOOK ENCYCLOPEDIA under the key word in the name of the order. Example: ODD FELLOWS, INDEPENDENT ORDER OF.

INDETERMINATE SENTENCE. See SENTENCE.

INDEX. The alphabetical list of topics and subjects which appears at the end of some books is called the index. This section is different from the table of contents which appears at the front of the book. The table of contents lists only the general headings or titles of the separate sections of the book. The index lists specific topics in the book and gives the number of the page or pages on which the information may be found about each topic.

There are many different types of indexes. But all serve the same purpose of classifying material in such a way as to make it very easy to find. In general, an index is made up in one of two ways. One way is by listing the topics and subjects of the material in straight alphabetical order, such as:

Adam, Page 108.
Emerald, Page 409.
Gem, Pages 111-213-409.

The other way is to list the topics in alphabetical order, but by major subjects:

Adam, Page 108.
Gem, Pages 111-213-409
Emerald, Page 409.

The emerald is a gem, and therefore is included under the major subject "gem."

An index which breaks up the content of a book into many subtopics is called an *analytical index*.

Many libraries have a type of *card file*, or *index*, which lists all their books. These files usually contain alphabetical listings of authors, titles, and subjects. Thus, a reader who wishes to read a book on psychology looks in the card file under the subject classification *psychology*. He finds a card which lists a book by Freud. The book's file number, or index number, is listed on a corner of the card. This number will guide the reader to the shelf on which the book can be found. By using the card index properly, the reader has saved himself many hours of searching for the book. P.Bu.

See also CROSS REFERENCE.

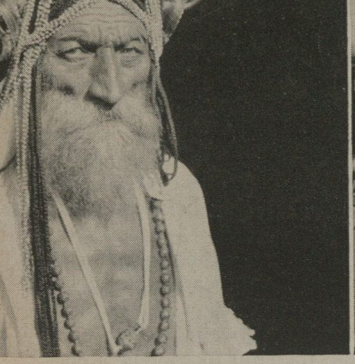
INDEX GLASS. See SEXTANT.

INDEX LIBRORUM PROHIBITORUM, *lye BRO rum proh HIB ih TOH rum*, is a list of books which the Roman Catholic Church considers harmful to the faith or morals of a Catholic. The Church forbids its members to read some of these books under any circumstances. Others may be read under certain conditions, or by certain classes or people, or when objectionable matter is eliminated to make the books meet the approval of the authorities.

The first official index was issued at Rome in 1559. There have been some forty editions of the official list. Pope Leo XIII in 1900 published a revised listing by which about 3,000 books were dropped from explicit censure. This list is still in force, with later additions. The *Congregation of the Index* was organized in 1571 to decide which books should be listed. Since 1917 this function has been taken over by the *Congregation of the Holy Office*.

Lists entitled *Index expurgatorius*, or with similar titles, were generally issued under the authority of the Spanish monarchs. F.J.S.

INDEX OF REFRACTION. See GEM (Index of Refraction).



Ewing Galloway; Pinney, Black Star

INDIA. There are two Indias. One is the great Indian peninsula of Asia, so large and so teeming with people that it is sometimes called a subcontinent. This India is rich in history, and is the home of one of the oldest civilizations in the world. The other—and newer—India is the Dominion (later Republic) of India, a self-governing country created in 1947 when Great Britain granted freedom to subject Indian peoples after eighty-nine years of British rule. These two countries, India and the Dominion of Pakistan, created at the same time, together cover most of the Indian peninsula. This article treats India the peninsula as a geographical unit, but discusses as separate countries the political units of India and Pakistan. See PAKISTAN.

Since the middle Ages, the very name *India* has meant mystery and romance to the peoples of the Western World. Early travelers to India returned with tales of wealth and beauty. They brought back silks and spices, jewels and tapestries. Early adventurers of Spain, Portugal, and England dreamed of sailing to India. The name *India* is an English form of the word *Hindustan*, which means *land of Hind*. Hindustan came from the Greek pronunciation of the Persian word *Sindhu*, which itself was a mispronunciation of the old Sanskrit name of the river Indus of India.

India is not merely a storybook land. It is of growing economic importance to all the world. The country has great natural resources which have hardly been touched. People throughout the world are concerned with the life and progress of millions of hard-working Indian peasants. India's slowly developing industries are a factor in world trade and economics.

India is a melting pot of Oriental peoples and civilizations. During its history of several thousand years, many different peoples have settled in the country. The various states and kingdoms of the Indian peninsula of southern Asia were not grouped together under the name of India until recent times.

India has huge cities and thousands of small farm villages, as well as thick jungles where wild tigers and elephants roam. It has hot plains, pleasant highlands, and snow-covered mountains. Some Indians are as rich as storybook princes. The members of the religious sect ruled by the Aga Khan gave him his weight in diamonds on his diamond anniversary. But in some years, many thousands of Indians have died of starvation. Most of the people of India cannot read or write. But in modern times India has produced the great poet Rabindranath Tagore and the scientists Sir J. C. Bose, Meghnad Saha, and Sir C. V. Raman. Tagore in literature and Raman in physics were the first Indians to win Nobel prizes.

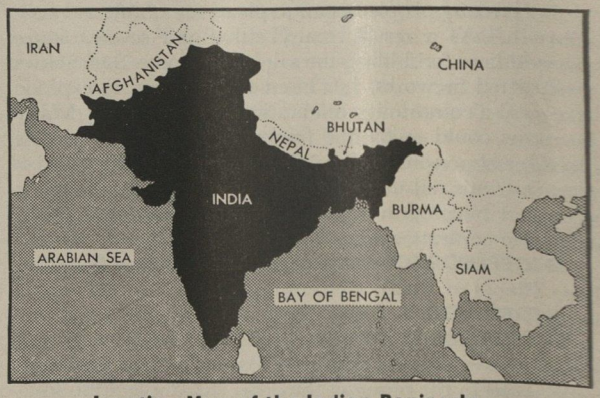
India has already given much to the world. It produced the great religious leader, Gautama Buddha. The Indian scholar Brahmagupta invented the decimal system in the 600's. Indians were also the first to use the so-called Arabic, or Hindu-Arabic, numerals in which we write numbers today. The *Rig-Veda*, the oldest known hymns, are Indian. Sanskrit, the old Indian language, is the oldest relative of most European languages. Indian poets wrote the great epic poems, the *Ramayana* and *Mahabharata*. These are mixtures of mythology and history, much like the epics written by the Greek poet, Homer. Many persons consider the Taj Mahal in Agra the most beautiful building in the world.

The Land and Its Resources

Extent: *Area*, about 1,600,000 square miles (India, 1,246,880 square miles; Pakistan, 361,520 square miles). *Greatest length*, about 1,900 miles; *greatest width*, about 1,900 miles. *Coast line*, more than 3,000 miles.

Physical Features: *Chief mountain ranges*, Himalaya, Vindhya Hills, Eastern Ghats, Western Ghats. *Chief peaks*, Mt. Everest, 29,141 feet; Mt. Godwin Austen, 28,251 feet; Kanchenjunga, 28,146 feet. *Chief rivers*, Ganges, Indus, Brahmaputra.

Location, Size, and Surface Features. India and Pakistan taken together are about half the size of the United States. The peninsula of India points down into the



Location Map of the Indian Peninsula

Indian Ocean. The Arabian Sea lies to the west, and the Bay of Bengal to the east. For the boundaries of India, see the colored map.

The western coast of India is a narrow strip of lowland backed by a steep mountain range, known as the Western Ghats. The eastern coastal strip is much wider and the Eastern Ghats are much lower.

India's northern border is slightly longer than its coast line. Along the border runs the highest mountain range in the world, the Himalayas. These mountains and connected ranges cut off India from the rest of Asia. A few passes break through the Himalayas. The most important of these is the Khyber Pass, which leads into Afghanistan. Another mountain range, the Vindhyas, runs east and west across central India. The Vindhyas have no peaks over 5,000 feet in height.

The most fertile and most heavily populated sections of India are the northern plains in the valleys of the Indus, Brahmaputra, and Ganges rivers. The broad, low region through which these rivers run stretches the full width of the peninsula. The plains slope upward to the south, to meet the tableland of the Deccan, or plateau country. The Deccan extends to the southern tip of India.

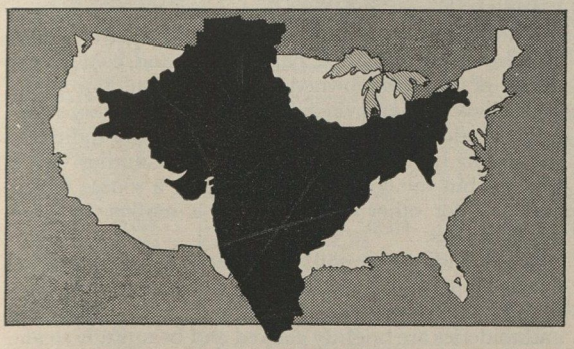
Rivers, Lakes, and Bays. India has many great rivers but few natural lakes. The most important rivers are the Indus, Ganges, and Brahmaputra. The Indus and its branches drain northwestern India. Its chief branches are the Sutlej, Beas, Ravi, Chenab, and Jhelum rivers. The Indus empties into the Arabian Sea.

The Ganges starts in the Himalayas and flows to the southeast, toward the Bay of Bengal. Many of India's largest cities are on the banks of the Ganges. The river forms an important highway for trade. It is also one of the sacred rivers of India.

The Brahmaputra joins the Ganges near its mouth. It runs generally westward and southward through the province of Bengal. These three rivers are fed by the snow of the Himalaya Mountains and never dry up. The smaller rivers of southern India, such as the Mahanadi, the Godavari and the Kistna, dry up during periods of little rainfall.

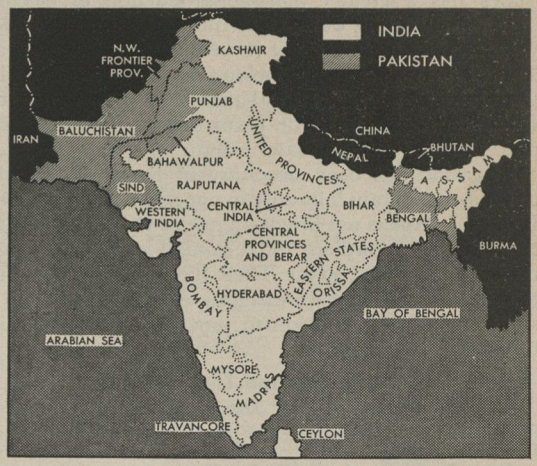
Coast Line. The Indian coast line is regular, and broken by few natural harbors. Calcutta has a port on the Ganges delta. There are natural harbors at Bombay, Cochin, Goa, Karachi, and Madras.

Climate. All India lies north of the equator. But half of the country lies within the torrid zone, and the lower parts of India are uncomfortably hot throughout the year.



How the Area of the Indian Peninsula (shown in black) compares with that of the United States, drawn to the same scale.

The climate is damp and hot in the coastal areas of the south and in the Ganges delta. The Indian desert just south of the Punjab is hot and dry. The Punjab itself is slightly cooler than the desert. The mountains of northern India have very cold weather. Kashmir, one of the states of northern India, has excellent winter sports.



The Partition of India was the result of years of bitter religious strife between Hindus and Moslems. Moslem leaders headed the new government of Pakistan. This country includes the northwestern provinces and parts of eastern provinces. The Dominion of India, whose people are mainly Hindus, occupies most of the central and southern provinces of the Indian peninsula.

The climate of most of India is greatly affected by the winds called the *monsoons*. (See MONSOON.) The winter monsoon begins in January. It blows from the northeast over land as well as sea, and is a dry wind. The summer monsoon begins in June. It comes from the southwest over the thousands of miles of the Indian Ocean. It brings with it most of India's rain. For weeks rain falls during part of each day. But rain does not fall equally over all India. Sind, which is flat and very hot, gets only a few inches of rainfall. But Bengal has more than sixty inches of rain each year.

Natural Resources. India's greatest resource is its fertile soil. But the farmers use only the most primitive methods. Some American missionaries and Indian leaders have experimented with improved methods of farming. They have shown that the Indian soil is capable of producing much more than it now does.

India has tremendous natural riches of all kinds. Few of the mineral resources have been touched. The Indian coal reserves are estimated at more than 36,000,000,000 tons. Iron reserves have been variously estimated from 3,000,000,000 to 20,000,000,000 tons of high-grade ore. India also has huge deposits of bauxite, chromite, magnesite, tungsten, mica, gold, silver, and copper.

The great forests of India produce enormous quantities of timber, and could yield much more without thinning out the forests too much.

India has more than 200,000,000 cattle. This is a third of all the cattle in the world. They are usually used only for milk and for farm labor, for the Hindus regard them as sacred and will not kill them. The jungles

of India are filled with wild animals. Elephants are tamed and used as work animals. There are wild animals from India in all the zoos and circus menageries of the world.

Conservation. India's great river systems could supply the country with great quantities of electric power. Among the countries of the world only the United States has a greater possible production of electric power from falling water than India. But India has developed only 3 per cent of its possible water power, as against the 33 per cent development of water power in the United States. After independence was won, both India and Pakistan made plans for developing water-power resources to a greater extent.

Irrigation has been necessary in India since early times, because rain falls only in one season. In northern India the farmers use irrigation canals to bring water to their fields. In southern India rainfall is stored in large tanks and artificial ponds. There have been attempts in recent years to improve the irrigation system. But there is still not enough irrigation to prevent crop failures in times of drought.

The People and Their Work

Population: 356,891,624. *Density*, about 297 persons per square mile. *Distribution*, rural, 87.2 per cent; urban, 12.8 per cent.

Chief Products: *Agricultural*, wheat, cotton, rice, tea, coffee, indigo, tobacco, jute, sugar. *Mineral*, iron, coal, manganese, mica, bauxite, copper, oil. *Manufactured*, carpets, rugs, cotton and silk materials, lace, brassware, silverware, iron and steel products, jute rope and bags, leather.

The People. Most Indians are members of the Caucasian, or white, race. Most of the peoples of Europe and America belong to this same race. There are four main groups of people in India. Dark-skinned, primitive tribes, such as the Bhils and the Gonds, live in the hills and jungles. They are the least civilized of the Indians. Only about one out of sixteen Indians belongs to this group.

About three out of every sixteen Indians are Dravidians, a dark-skinned people who live mostly in southern India. They are usually Hindus. The so-called Aryans, who include both Hindus and Moslems, make up the largest group. About ten out of every sixteen Indians are Aryans. They have much lighter skins than the hill and jungle people and the Dravidians. There is also a small Semitic group, which includes Moslems of Arab and Turkish origin, and Jews.

Costume. The dress of the people of India varies a great deal in different parts of the country and among different religions. But in general, Indian dress is light and loose to suit the hot climate. White and bright colors are common. The dress of many Indians is a long piece of cloth draped around the body. Many men wear a *dhoti*, a simple white garment which is draped around the body and legs to form a sort of loose trousers. This is the type of garment which Mohandas Gandhi wore.

The *sari* is the usual garment of women. It is a straight piece of cloth wrapped around the body to form a long dress, with the loose end thrown over the head. Many saris are brightly colored. Wealthy women may wear saris made of silk, with borders of richly worked gold thread.

Headgear for men in India varies a great deal according to locality, and to a lesser extent according to religion. A Moslem may wear a turban, a fez, or a hat not unlike the Cossack's. Sometimes Moslems wear flat embroidered caps. Some Hindus wear turbans, and some go bare-headed. Some very orthodox Hindus paint caste marks on their foreheads. All Sikhs wear turbans. Parsees wear embroidered caps, which are roughly cone-shaped. Many Indian men of all religions now wear a sort of overseas cap of white homespun, called a "Gandhi cap."

In northern India, men wear long trousers which are wide at the top, and tight-fitting from the knee to the ankle. These are called *tang pyjama*. Long-skirted, tight-fitting coats called *achkans* are worn over them. Some women of North India also wear full trousers, called *selwar*, topped with a long blouse and a veil. Indian women are very fond of jewelry, especially earrings and bracelets. Often the bracelets are made of thin glass, and tinkle as the wearer moves. See DRESS (India; color plate, The Orient).

Agriculture. About two out of three Indians are farmers. About one third of these must also do some work for wages. The average Indian farm is only seven acres, and there are many of two acres or less. Many farms are owned by landlords. The Hindu laws of inheritance tend to make farms owned by the farmers smaller and smaller in each generation. These laws require that a man's farm be divided equally among his sons upon his death, even though the share of each son is too small to give him a living.

Modern methods of agriculture do not work well on such tiny pieces of ground. The income of the average farmer is so small that he cannot hope to buy more land or better tools. He lives and dies in debt, and seldom has quite enough to eat.

India leads the world in tea production. It has the largest peanut acreage in the world and is second to Cuba in the production of sugar cane. Only China grows more rice than India, and only the United States produces more cotton than India and Pakistan. India is the third largest producer of tobacco. But India does not grow enough food for its needs.

Manufacturing. There is very little large-scale industry in India. But the Indian-owned and operated Tata mills at Jamshedpur near Calcutta are the largest iron and steel works in the British Commonwealth.

India's largest machine industries are the cotton mills of Bombay and the jute mills of Calcutta. There are also sugar refineries, paper mills, and coal mines. Many of these are owned by the British, but many others have Indian owners. Nearly all the factory workers are Indians. There are about 15,500,000 industrial workers in India. Indian industry grew during World War II, but the country is still largely a source of raw materials for other countries and a market for their manufactures.

Many Indians are skilled in weaving fine fabrics by hand. They make rugs and carpets, and spin fine laces of gold and silver thread. Kashmir shawls and Indian embroideries are brightly colored and beautifully made. Indians are also noted for handmade jewelry, silverware, and brassware. Many Indians are skillful wood carvers.

INDIA, PAKISTAN, CEYLON AND BURMA

INDIA

Population..356,891,624

Cities

Agra, 284,149 C 6
Ahmadnagar, 54,193 E 5
Ahmedabad, 591,267 D 5
Ajmer, 147,258 C 5
Akola, 62,564 D 6
Aligarh, 112,655 C 6
Allahabad, 260,630 C 7
Alleppey, 56,333 G 6
Almora, 9,688 C 6
Alwar, 64,143 C 6
Ambala, 62,419 B 6
Ambikapur D 7
Amraoti, 61,997 D 6
Amritsar, 389,581 B 5
Anakapalle, 23,376 E 7
Anantapur F 6
Anantnag B 6
Arkonam F 6
Arrah, 53,122 C 7
Asansol, 55,797 D 8
Aurangabad, 50,924 E 6
Balasore D 8
Balotra C 5
Banda, 22,415 C 7
Bangalore, 248,334 F 6
Bankura, 31,703 D 8
Baramula B 5
Bareilly, 180,526 C 6
Baripada D 8
Barmer C 5
Baroda, 153,301 D 5
Barsi, 27,610 E 6
Batala, 33,204 B 6
Beawar, 28,342 C 5
Bela C 7
Belgaum, 58,319 E 5
Bellary, 56,148 E 6
Benares, 255,744 C 7
Berhampore, 27,403 D 8
Berhampur, 37,750 E 7
Betul D 6
Bezwada, 86,184 E 7
Bhadra C 6
Bhagalpur, 93,254 C 8
Bharatpur, 30,173 C 6
Bhatpara, 117,044 D 8
Bhavnagar, 102,851 D 5
Bhind C 6
Bhopal, 75,228 D 6
Bhor E 5
Bhuj, 21,859 D 4
Bidar E 6
Bihar, 54,551 C 8
Bijapur, 39,747 E 6
Bikaner, 127,226 C 5
Bilaspur, 31,374 D 7
Bobbili, 20,544 E 7
Bombay, 1,489,883 E 5
Bowringpet F 6
Broach, 55,810 D 5
Burdwan, 62,910 D 8
Burhanpur, 53,987 D 6
Calcutta, 2,108,891 D 8
Calicut, 126,352 F 6
Cawnpore, 487,324 C 7
Chaibasa D 8
Chakradharpur D 8
Chanda, 28,138 E 6
Chandernagor, 38,284 D 8
Chapra, 55,142 C 7
Chitaldroog F 6
Chittoor, 22,018 F 6
Cocanada, 75,140 E 7
Cochin, 22,818 G 6
Coimbatore, 130,348 F 6
Conjeeveram, 74,635 F 6
Cuddalore, 60,632 F 6
Cuddapah, 22,602 F 6
Cutch Mandvi, 25,342 D 4
Cuttack, 74,291 D 8
Daltonganj D 7
Darbhanga, 69,203 C 8
Darjeeling, 10,000 C 8
Dehra Dun, 57,183 B 6
Delhi, 521,849 C 6
Dharamjaygarh D 7
Dharmapuri F 6
Dharmsala B 6
Dharwar, 41,671 E 6
Dhulia, 53,308 D 5
Dindigul, 56,275 F 6
Ellore, 64,911 E 7
Etawah, 53,114 C 6
Farrukhabad, 59,580 C 6
Fatehpur C 7
Ferozepore, 64,634 B 5
Fyzabad, 55,215 C 7
Gadag, 51,283 E 6
Gangtok C 8
Gauhati, 21,797 C 9
Gaya, 105,223 D 7
Gilgit A 5
Giridih, 21,122 D 8
Gonda C 7
Gorakhpur, 84,650 C 7
Gudur F 6
Gulbarga, 52,551 E 6
Guntur, 83,599 E 7
Hamirpur C 7
Hardwar, 33,287 C 6
Harihar F 6
Hassan F 6
Hissar, 25,179 C 6
Hoshiarpur, 25,925 B 6
Howrah, 379,292 D 8
Hubli, 95,512 E 6
Hyderabad, 739,159 E 6
Imphal, 99,716 D 9
Indore, 203,695 D 6
Jagdalpur E 7
Jaipur, 175,810 C 6
Jaisalmer C 5
Jajpur D 8
Jalaun C 6
Jalgaon, 34,375 D 6
Jalna, 22,408 E 6
Jammu, 50,379 B 5
Jamnagar, 71,588 D 5
Jamshedpur, 148,711 D 8
Janjiri E 5
Jaunpur, 37,675 C 7
Jeypore E 7
Jhalrapatan D 6
Jhansi, 75,574 C 6
Jodhpur, 126,842 C 5
Jorhat C 9
Jubbulpore, 178,339 D 6
Jullundur, 110,969 B 6
Junagad, 58,111 D 5
Kadiri F 6
Kanker D 7
Kargil B 6
Karwar F 5
Kasaragod F 6
Katni D 7
Kavali F 6
Kendrapara D 8
Khambhaliya D 4
Khandwa, 34,622 D 6
Kharagpur, 87,185 D 8
Kishangarh C 5
Kohima C 9
Kolar, 133,859 F 6
Kolhapur, 93,032 E 5
Kotah, 37,876 C 6
Krishnagiri F 6
Kumbakonam, 67,008 F 6
Kuri C 5
Kurnool, 35,314 E 6
Lakhimpur C 7
Lalitpur D 6
Lashkar, 113,718 C 6
Ledo C10
Leh B 6
Lohardaga D 7
Lucknow, 387,177 C 7
Ludhiana, 111,639 B 6
Madras, 777,481 F 7
Madura, 239,144 G 6
Mahbubnagar E 6
Makri E 7
Maler-Kotla, 22,396 B 6
Mandsaur D 6
Mangalore, 81,069 F 5
Masulipatam, 59,146 E 7
Mattancheri, 53,346 G 6
Meerut, 169,290 C 6
Mercara F 6
Midnapore, 32,021 D 8
Miraj, 26,465 E 5
Mirzapur, 70,944 C 7
Monghyr, 63,114 C 8
Moradabad, 142,414 C 6
Muttra, 76,716 C 6
Muzaffarpur, 54,009 C 8
Mysore, 150,540 F 6
Nagercoil, 51,657 G 6
Naggar B 6
Nagpur, 301,957 D 6
Nasik, 52,386 E 5
Negapatam, 52,937 F 6
Nellore, 56,315 F 6
New Delhi, 93,733 C 6
Nohar C 5
Okha D 4
Ootacamund, 24,616 F 6
Palanpur, 20,347 D 5
Palghat, 55,160 F 6
Pandharpur, 29,460 E 6
Panna D 7
Partabpur E 7
Pathankot B 6
Patiala, 69,850 B 6
Patna, 175,706 C 8
Phalodi C 5
Pokaran C 5
Poona, 257,554 E 5
Porbandar, 33,383 D 4
Port Blair F 9
Puri, 37,568 E 8
Purulia, 25,974 D 8
Quilon, 33,739 G 6
Rae-Bareli C 7
Raichur, 27,910 E 6
Raigarh D 7
Raipur, 63,465 D 7
Rajahmundry, 74,564 E 7
Rajkot, 52,178 D 5
Ramban B 6
Rampur, 89,322 C 6
Ranchi, 54,178 D 8
Raniganj D 8
Ratnagiri, 23,906 E 5
Rewa, 25,206 D 7
Rewari, 26,269 C 6
Sadiya C10
Saharanpur, 108,263 C 6
Sakti D 7
Salem, 129,702 F 6
Salur E 7
Sambalpur D 7
Sandila C 7
Sasaram, 25,175 D 7
Saugor, 50,733 D 6
Secunderabad, 120,80.1 E 6
Seringapatam, 6,300 F 6
Shahgarh C 4
Shahjahanpur, 110,163 C 6
Shillong, 21,300 C 6
Shimoga, 20,661 F 6
Sholapur, 203,691 E 6
Sibsagar C 9
Sikar, 26,297 C 6
Silchar D 9
Simla, 51,706 B 6
Sirpur E 6
Sirsa C 6
Sitapur, 24,720 C 7
Sonpur Raj D 7
Srinagar, 207,787 B 6
Surat, 171,443 D 5
Suri D 8
Talcher D 8
Tanjore, 68,702 F 6
Tezpur C 9
Tinnevelly, 60,676 G 6
Tinsukia C10
Tonk Raj, 35,798 C 6
Trichinopoly, 159,566 F 6
Trichur, 57,524 F 6
Trivandrum, 128,365 G 6
Tumkur F 6
Tuticorin, 75,614 G 6
Udaipur, 59,648 D 5
Udhampur B 6
Ujjain, 72,729 D 6
Vellore, 71,502 F 6
Veraval, 21,114 D 5
Vizagapatam, 70,243 E 7
Vizianagram, 51,749 E 7
Warangal, 92,808 E 6
Wardha D 6

PAKISTAN

Population . . 75,687,000

Cities

Ahmadpur C 5
Bahawalpur, 20,943 C 5
Bannu, 24,768 B 5
Bela C 4
Bhag C 4
Bhakkar B 5
Bogra D 8
Campbellpur B 5
Chakai A 5
Chakwal B 5
Chaman B 4
Chandpur D 9
Chiniot, 25,841 B 5
Chitral A 5
Chittagong, 92,301 (Greater Chittagong, 269,000) D 9
Comilla, 31,365 D 9
Dacca, 213,218 (Greater Dacca, 401,000) D 9
Dadu C 4
Dalbandin C 3
Dargai B 5
Dera-Ghazi Khan, 23,468 B 5
Dera-Ismail Khan, 38,956 B 5
Duki B 4
Fort Sandeman B 4
Garruk C 4
Gujranwala, 124,000 B 5
Hindubagh B 4
Hyderabad, 229,000 C 4
Jacobabad C 4
Jhal Jhao C 4
Jhelum B 5
Kalabagh B 5
Kalat C 4
Kamarod C 3
Kanrach C 4
Karachi, 1,005,000 D 4
Kasur, 53,101 B 5
Khairpur, 15,740 C 4
Khanpur C 5
Khokhropar C 5
Khuzdar C 4
Kishorganj D 9
Kohat, 25,100 B 5
Kohlu C 4
Kolwa C 3
Ladgasht C 3
Lahore, 849,000 B 5
Lahri C 4
Larkana, 26,841 C 4
Leiah B 5
Lodhran C 5
Lyallpur, 180,000 B 5
Mach C 4
Mangla B 5
Mardan, 23,848 B 5
Mastung C 4
Mehar C 4
Mianwali B 5
Montgomery, 26,164 B 5
Multan, 190,000 B 5
Murgha Kibzai B 4
Muzaffargarh B 5
Mymensingh, 52,950 D 9
Nagar-Parkar D 5
Nowshera B 5
Nushki C 4
Ormara C 3
Padidan C 4
Panjgur C 3
Pasni C 3
Pasrur B 5
Peshawar, 114,000 B 5
Pishin B 4
Quetta, 82,000 B 4
Rahimyar-Khan C 5
Rangpur, 20,749 C 8
Rawalpindi, 243,000 B 5
Razmak B 4
Sehwan, 48,088 C 4
Shahpur C 4
Shikarpur, 62,746 C 4
Shireza C 4
Shujabad C 5
Sialkot, 152,000 B 5
Sibi C 4
Sonmiani C 4
Sukkur, 66,466 C 4
Sylhet, 21,435 D 9
Tank B 5
Tatta D 4
Thal B 5
Turbat C 3
Umarkot C 4
Vihowa B 5
Wana B 4

CEYLON

Population . . .7,539,000

Cities

Anuradhapura, 12,287 G 7
Badulla, 13,213 G 7
Batticaloa, 12,948 G 7
Colombo, 355,374 G 6
Galle, 49,038 G 7
Hambantota, 3,966 G 7
Jaffna, 62,922
Kandy, 50,767
Kurunegala, 13,51
Mannar, 5,190
Matara, 23,434
Nuwara Eliya, 9,8
Puttalam, 7,764
Trincomalee, 29,1

BURM

Population . . 18

Cities

Akyab, 38,094
Allanmyo, 12,511
Athok
Bassein, 45,662
Bhamo, 8,011
Bilin
Chauk, 12,830
Gangaw
Gwa
Henzada, 28,542
Homalin
Indaw
Insein, 20,487
Kalewa
Kamaing
Katha, 4,233
Keng Tung
Kyaiklat, 10,658
Kyangin
Kyaukpyu, 4,232
Kyaukse, 7,353
Lashio, 4,638
Letpadan, 12,160
Lonkin
Magwe, 8,209
Maliwun
Mandalay, 163,53
Martaban
Maungdaw
Mawlaik, 2,278
Maymyo, 21,335
Meiktila, 8,830
Mergui, 20,405
Minbu, 6,005
Mogaung
Mogok
Mong Mit
Monywa, 10,800
Moulmein, 65,506
Myingyan, 25,457
Myitkyina, 7,328
Pakokku, 23,115
Paletwa
Papun, 1,881
Pauk
Paungde, 13,479
Pegu, 21,712
Prome, 28,295
Putao
Pyapon, 12,338
Pyinmana, 17,656
Pyu
Rangoon, 600,000
Sagaing, 14,127
Sandoway, 4,070
Saw
Shingbwiyang
Shwebo, 11,286
Taungdwingyi
Taunggyi, 8,652
Tavoy, 29,018
Tenasserim
Tharrawaddy, 7,1
Thaton, 16,851
Toungoo, 23,223
Victoria Point
Wuntho
Yamethin, 9,291
Ye

NEPA

Population . . .6

Cities

Katmandu, 108,80

BHUTA

Population . . . .

Cities

Punakha

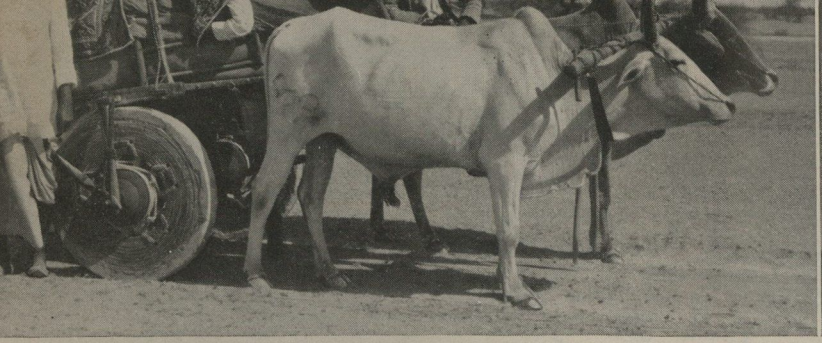
INDIA, PAKISTAN BURMA AND CEYLON
1 Inch = 252 Statute Miles
Miles 100 0 100 200 300
National Capital
Size of symbols and type indicates relative population
Polyconic Projection
RELIEF
Feet
5 000
2 000
1 000
500
Sea Level
Below Sea Level
500
5 000
COSMO RELIEF INDIA
Copyright by RAND McNALLY & COMPANY
Made in U. S. A.
Longitude East of Greenwich
Arabian Sea
Bay of Bengal
Mouths of the Indus
Mouths of the Ganges
Mouths of the Godavari
Mouths of the Irrawaddy
Tropic of Cancer
Gulf of Oman
Gulf of Cutch
Gulf of Cambay
Gulf of Martaban
Gulf of Siam
Ten Degree Channel
Sombrero Channel
Great Channel
SOVIET UNION
AFGHANISTAN
IRAN (PERSIA)
PAKISTAN
INDIA
CHINA
TIBET
NEPAL
BHUTAN
BURMA
SIAM (THAILAND)
CEYLON
MALAYA
MALAY PENINSULA
OMAN
SAUDI ARABIA
Delhi
Lahore
Bombay
Calcutta
Rangoon
Bangkok
Madras
Hyderabad
Ahmedabad
Kunming
Chengtu
Kanging
Lhasa
Kabul
Karachi
Colombo
Kandy
Trincomalee
Jaffna
Trivandrum
Cape Comorin
Laccadive Islands (India)
Maldive Islands
Andaman Islands (India)
Nicobar Islands (India)
Cape Negrais
Cape Comorin
Ras al Khaima
Muscat
Masira Island
Ras el Hadd
Ras Madraka
Kathiawar Peninsula
Deccan
Malabar Coast
Coromandel Coast
Indus
Ganges
Brahmaputra
Godavari
Irrawaddy
Mekong
Salween
Chao Phraya
Kyaukpyu
Sandoway
Henzada
Bassein
Pyapon
Moulmein
Tavoy
Mergui
Tenasserim
Ban Bangsaphan Yai
Victoria Point
Maliwun
Surat Thani
Phuket
Phatthalung
Nakhon Si Thammarat
Thale Luang
Songkhla
Pattani
Alor Star
Butterworth
Penang
Sabang
Koetaradja
Sumatra (Indon.)
Diamantpunt
Port Blair
Prepared expressly for THE WORLD BOOK ENCYCLOPEDIA

INDIA, PAKISTAN, CEYLON AND BURMA

Physical Features

Deccan (Plain) ..... E 6
Dhaulagiri, Mt. (Nepal) . C 7
Everest, Mt. (Nepal) ... C 8
Ganges, Mouths of the . D 8
Ganges R. ..... D 8
Ghats, Eastern (Range) . E 7
Ghats, Western (Range) . D 5
Godavari, Mouths of the . E 7
Godavari R. ..... E 6
Godwin Austen, Mt. ... A 6
Gogra R. ..... C 7
Great Channel ..... G 9
Great Nicobar (Isl.) .... G 9
Hagari R. ..... F 6
Himalaya Mts. ..... B 6
Indian Ocean ..... G 3
Indravati R. ..... E 7
Indus, Mouths of the .. D 4
Indus R. ..... C 5
Irrawaddy, Mouths of the (Burma) ..... E 9
Irrawaddy R (Burma) .. D10
Japuo Peak ..... C 9
Jhelum R. ..... B 5
Karakoram Pass ..... A 6
Karakoram Range ..... A 6
Kathiawar Peninsula ... D 4
Khasi Hills ..... C 9
Khyber Pass ..... B 5
Kinchinjunga, Mt. (Nepal) ..... C 8
Kirthar Range ..... C 4
Kistna R. ..... E 6
Kori Creek ..... D 4
Kosi R. ..... C 8
Kulhakangri, Mt. ..... C 9
Kunar R. ..... A 5
Laccadive Is. ..... F 5
Little Andaman (Isl.) .. F 9
Luni R. ..... C 5
Mahi R. ..... D 5
Makran, Central Range . C 3
Malabar Coast ..... F 5
Maldive, Is. ..... G 5
Manjra R. ..... E 6
Mannar, Gulf of ..... G 6
Martaban, Gulf of (Burma) E10
Mashkel Lake ..... C 3
Mergui Archipelago F10
Middle Andaman (Isl) .. F 9
Narbada R. ..... D 6
Negrais, Cape (Burma) . E 9
Nicobar Is. ..... G 9
North Andaman (Isl.) .. F 9
Palk Strait (Ceylon) ..... G 6
Pangong (Lake) ..... B 6
Pangsau Pass (Burma) . C10
Penner R. ..... F 6
Pedrotallagal (Peak), (Ceylon) ..... G 7
Pishin R. ..... C 4
Porali R. ..... F 5
Rann of Cutch ..... G 5
(Swamp) ..... E 6
Sabarmati R. ..... G 6
Salween R (Burma) E10
Sittang R. ..... C 3
Sombrero Channel F10
Son R. ..... F 9
South Andaman ..... D 6
Sulaiman Range ..... E 9
Sutlej R. ..... G 9
Tapti R. ..... F 9
Tel R. ..... G 6
Ten Degree Channel ..... B 6
Thar or Indian Desert C10
Tunga R. ..... F 6
Vaigai R. ..... G 7
Victoria, Mt. (Burma) ..... C 4
Vindhya Mts. ..... F 5
Wainganga R. ..... G 5
Wardha R. ..... C 4

Transportation. India has a better transportation system than any other country on the continent of Asia. The British Government built a large railroad network in order to promote trade. Almost 40,000 miles of railroads link all the important cities. There are also about 285,000 miles of roads, with 63,706 miles of good highways. Important Indian cities are linked by air service. The air lines grew considerably during World War II. But with all these more modern means of transportation, the villagers, who are about 90 per cent of the popula-



Pan American; Black Star

Strange Means of Transportation in India. The two-wheeled cart at the left, drawn by zebus, is curtained to screen the bride riding in it. At the right, three Indians are riding in a howdah, or chair of state, on an elephant's back.

tion, still use bullock carts on the rough and dusty country roads. In the cities the bicycle is a very important means of transportation.

The large rivers, especially the Ganges, are used a great deal in trade. Canals connect some of the smaller rivers. There is steamer service between the large ports and between India and Ceylon.

Trade. India had a large foreign trade long before Europeans became interested in the country. Its great foreign trade now amounts to nearly $2,000,000,000 yearly. A large part of its exports are raw materials for the industries of other countries.

Most of India's trade, both buying and selling, is with Great Britain and the United States. The most important imports of India are cotton materials, machinery, oil, foodstuffs, and manufactured articles. The chief exports include indigo, wood, coffee, wheat, jute, cotton, tea, and animal hides.

Communication. All Indian cities and many small towns have telephone service, and telegraph lines reach into all parts of the country. Most large cities have newspapers, printed in both English and native languages. Radio broadcasting is government-controlled.

Cities. Nearly nine out of ten Indians live in small towns and villages. These are usually collections of dirt and straw huts, crowded together in the midst of the surrounding fields. In the Punjab and farther north, houses are often built of cement and brick. Farmers live almost entirely in villages, which are organized and run largely by a group of the older men under the leadership of a head man.

Business, intellectual, and political life centers in the many large cities in India. Most cities have prosperous sections where both Indian and foreign businessmen and their families live. These sections often have splendid buildings. Other parts of a city are usually crowded with dirty, narrow streets. Indians live in sections of a city according to their religion and their caste, in spite of efforts to abolish caste distinctions. Those of lowest caste usually live in the poorest sections.

One of the features of Indian life is that much business is done in the outdoors. Barbers, food sellers, letter writers, and merchants of all kinds carry on their trades in the streets or on the sidewalks. Even schools are held outdoors.

Some of the principal cities of the Indian Peninsula, including New Delhi, capital of the Republic of India, are described under their own names in THE WORLD BOOK ENCYCLOPEDIA. For the names of these cities, see the list of *Related Subjects* at the end of this article. Other important cities include the following:

Agra, *AH grah* (population 284,149), the third largest city in Uttar Pradesh, a state in northern India, is one of the peninsula's oldest cities. It is an important trading center for grain, sugar, tobacco, and cotton. The city is well known for the gold lace and delicate inlaid mosaics which its people manufacture, chiefly by hand.

Agra also is famous as the site of the Taj Mahal. In the 1600's Emperor Shah Jahan ordered this beautiful marble tomb built in memory of his wife, Mumtaz. See TAJ MAHAL.

Allahabad, *AL ah hah bahd* (population 260,630), a chief city of the state of Uttar Pradesh, is noted as one of the holy cities of India. The name *Allahabad* means *City of God*. Allahabad lies where the Ganges and the Jumna meet. Hindus consider these two rivers sacred. Many Hindus make pilgrimages to the city, especially at the time of the Mahemela, and annual religious festival.

Allahabad was founded in the 200's B.C. Its beautiful old buildings include a famous mosque called the Jama Musjid, and an ancient palace and fort built by the Mogul emperor, Akbar, in the 1500's.

Allahabad is a center of trade for products of the surrounding farms, especially sugar and cotton. Jawaharlal Nehru, one of the leaders of the Indian National Congress and, later, Prime Minister of the Dominion of India, was born in Allahabad in 1889. In the 1900's Allahabad became the meeting place of the Indian National Congress. Headquarters of the Congress were in the Nehru family home.

Amritsar, *am RIHT sahr* (population 391,010), a manufacturing center and also the second largest city in the state of Punjab. Amritsar is the holy city of the Sikh community, and the site of the famous Golden Temple. The temple stands in the midst of a pool of constantly changing fresh water.

The people of Amritsar are Hindus and Sikhs. Many of them work in the city's factories, which include steel mills, cement plants, carpet and silk-weaving factories, spinning mills, and factories where electrical and chemical products are manufactured.

Bangalore, *bang gah LOHR* (population 248,334), a fo

erican: Black Star
are riding in c
.

n their trades
ools are held

n Peninsula.
olic of India.
THE WORLD
ese cities, see
article. Other

e third largest
India, is one
ortant trading
ton. The city
ate inlaid mo-
y by hand.
Taj Mahal. In
this beautiful
Mumtaz. See

n 260,630), a
s noted as one
lahabad means
anges and the
rivers sacred
y, especially at
ligious festival
c. Its beautiful
alled the Jama
t built by the

ucts of the sur
on. Jawaharla
National Con
minion of India
oo's Allahabad
National Con
e in the Nehr

,010), a mann
rgest city in th
of the Sikh com
n Temple. Th
nstantly chang

nd Sikhs. Man
ch include ste
aving factorie
rical and chem

248,334), a fo

Taking Farm Produce to a City Market in Southern India. The cattle are zebus. They are easily recognized by their humped shoulders and their drooping ears. Cat beasts of burden in India, but are seldom killed

Pan American; Black Star

Strange Means of Transportation in India. The two-wheeled cart at the left, drawn by zebus, is curtained to screen the bride riding in it. At the right, three Indians are riding in a howdah, or chair of state, on an elephant's back.

tion, still use bullock carts on the rough and dusty country roads. In the cities the bicycle is a very important means of transportation.

The large rivers, especially the Ganges, are used a great deal in trade. Canals connect some of the smaller rivers. There is steamer service between the large ports and between India and Ceylon.

Trade. India had a large foreign trade long before Europeans became interested in the country. Its great foreign trade now amounts to nearly $2,000,000,000 yearly. A large part of its exports are raw materials for the industries of other countries.

Most of India's trade, both buying and selling, is with Great Britain and the United States. The most important imports of India are cotton materials, machinery, oil, foodstuffs, and manufactured articles. The chief exports include indigo, wood, coffee, wheat, jute, cotton, tea, and animal hides.

Communication. All Indian cities and many small towns have telephone service, and telegraph lines reach into all parts of the country. Most large cities have newspapers, printed in both English and native languages. Radio broadcasting is government-controlled.

Cities. Nearly nine out of ten Indians live in small towns and villages. These are usually collections of dirt and straw huts, crowded together in the midst of the surrounding fields. In the Punjab and farther north, houses are often built of cement and brick. Farmers live almost entirely in villages, which are organized and run largely by a group of the older men under the leadership of a head man.

Business, intellectual, and political life centers in the many large cities in India. Most cities have prosperous sections where both Indian and foreign businessmen and their families live. These sections often have splendid buildings. Other parts of a city are usually crowded with dirty, narrow streets. Indians live in sections of a city according to their religion and their caste, in spite of efforts to abolish caste distinctions. Those of lowest caste usually live in the poorest sections.

One of the features of Indian life is that much business is done in the outdoors. Barbers, food sellers, letter writers, and merchants of all kinds carry on their trades in the streets or on the sidewalks. Even schools are held outdoors.

Some of the principal cities of the Indian Peninsula, including New Delhi, capital of the Republic of India, are described under their own names in THE WORLD BOOK ENCYCLOPEDIA. For the names of these cities, see the list of *Related Subjects* at the end of this article. Other important cities include the following:

Agra, *AH grah* (population 284,149), the third largest city in Uttar Pradesh, a state in northern India, is one of the peninsula's oldest cities. It is an important trading center for grain, sugar, tobacco, and cotton. The city is well known for the gold lace and delicate inlaid mosaics which its people manufacture, chiefly by hand.

Agra also is famous as the site of the Taj Mahal. In the 1600's Emperor Shah Jahan ordered this beautiful marble tomb built in memory of his wife, Mumtaz. See TAJ MAHAL.

Allahabad, *AL ah hah bahd* (population 260,630), a chief city of the state of Uttar Pradesh, is noted as one of the holy cities of India. The name *Allahabad* means *City of God.* Allahabad lies where the Ganges and the Jumna meet. Hindus consider these two rivers sacred. Many Hindus make pilgrimages to the city, especially at the time of the Mahemela, and annual religious festival.

Allahabad was founded in the 200's B.C. Its beautiful old buildings include a famous mosque called the Jama Musjid, and an ancient palace and fort built by the Mogul emperor, Akbar, in the 1500's.

Allahabad is a center of trade for products of the surrounding farms, especially sugar and cotton. Jawaharlal Nehru, one of the leaders of the Indian National Congress and, later, Prime Minister of the Dominion of India, was born in Allahabad in 1889. In the 1900's Allahabad became the meeting place of the Indian National Congress. Headquarters of the Congress were in the Nehru family home.

Amritsar, *am RIHT sahr* (population 391,010), a manufacturing center and also the second largest city in the state of Punjab. Amritsar is the holy city of the Sikh community, and the site of the famous Golden Temple. The temple stands in the midst of a pool of constantly changing fresh water.

The people of Amritsar are Hindus and Sikhs. Many of them work in the city's factories, which include steel mills, cement plants, carpet and silk-weaving factories, spinning mills, and factories where electrical and chemical products are manufactured.

Bangalore, *bang gah LOHR* (population 248,334), a for-

tified city in the state of Mysore. Bangalore is located on a high plain, almost three thousand feet above sea level. This gives the city a pleasant, healthful climate. It is an educational center, the home of both Indian and British schools and colleges. The chief products of the city are gold and silver lace, silk, cotton, and woolen materials, and carpets.

Baroda, *bah RO dah* (population 153,301), a trading center in western India and the capital of the important Indian state of Baroda. The city lies about 250 miles north of Bombay, in the midst of rich farm lands. The products of the farms are bought and sold in the street markets of Baroda. The chief trade is in grain, flax, cotton, and tobacco. Baroda is the site of Baroda College.

Benares, *behn NAH rez* (population 263,100), a holy city of the Hindus, on the banks of the Ganges River. Benares lies almost four hundred miles northwest of Calcutta. It is the fourth largest city in the state of Uttar Pradesh. The city is noted for its many street markets, or bazaars, where the products of the city are sold. These products include fine shawls, saris, and materials embroidered with gold thread, hand-hammered brassware, and heavy gold and silver jewelry.

Hindus make pilgrimages from everywhere in India to bathe in the waters of the Ganges River at Benares. The red and gold domes of minarets rise above the fifteen hundred temples for which Benares is famous. Cattle held sacred by the Hindus roam the streets, and sacred monkeys chatter in the temples. Until the 1900's Benares was not only a very holy city, but also a very dirty one. Modern sanitary improvements have done much to clean up the old streets and native quarters.

Howrah, *HOW rah* (population 379,292), a river port and the second largest city in Bengal. Howrah lies on the banks of the Hooghly River, opposite Calcutta. Freight comes into Howrah over roads and railroads, and is shipped from the city's great docks. Howrah has a number of mills where cotton material is manufactured and where jute fibers are woven into rope, sacks, and bags.

Jaipur, *jy POOR*, or **Jeypore,** *ji PORE* (population 175,810), the capital of the state of Jaipur, in Rajputana. Jaipur is different from most Indian cities because its streets are straight and wide, and are laid out in city blocks. Most of the buildings in Jaipur are made of rose-colored stone or stucco. The huge palace of the maharajah stands in the center of the city. Jaipur is a trading center for home manufactured products, which include muslin, carpets, pottery, brassware, and jewelry.

Jamshedpur, *jahm shayd POOR* (population 148,711), the steel manufacturing center of India. The city is in the state of Bihar, and about 150 miles west of Calcutta. It lies near great deposits of iron, coal, mica, and manganese. Its location near these minerals has led to the city's rapid growth and the development of the Tata Mill, the greatest steel plant in India.

Karachi, *kah RAH che* (population 359,492), one of the chief seaports of India, and capital of the Dominion of Pakistan. Karachi stands on the low, sandy coast of the Arabian Sea. It is the westernmost city of Pakistan. Karachi is connected by railroad with many other cities. Much shipping goes through its excellent natural harbor. The largest docks are built on the island of Kiamari, three miles away from Karachi. The chief products shipped include animal hides, wheat and other grains, cotton, and salt.

Nagpur, *NAHG poor* (population 301,957), the capital and the chief city of the state of Maghya Pradesh. The name *Nagpur* means *town of serpents*. Nagpur is an important railroad center. Cotton from near-by farms is manufactured into cloth in Nagpur and shipped to other parts of India. Hislop College and Nagpur University, as well as special engineering and agricultural schools, are located in Nagpur.

Patna, *PUHT nah* (population 175,706), the capital and the largest city of the state of Bihar. Patna stretches nine miles along the right bank of the Ganges River. Much trading goes on in the bazaars that line the narrow, crooked streets of the city. Patna is a very old city. It was a trading center known as Lotus City four hundred years before the birth of Christ.

Poona, *POO nah* (population 258,197), the third largest city in the state of Bombay. Poona is built in the hills, 1,850 feet above sea level. It is the summer headquarters of the Bombay government. Poona is the site of Deccan University and of the Women's University of Poona. The chief industries in the city are cotton and flour manufacturing and dairying.

Simla, *SIM lah* (population about 27,494), a summer resort in the Republic of India. The city is in the state of Punjab, about 170 miles north of Delhi. It is built high in the Himalaya Mountains, about 7,000 feet above sea level. The cool, healthful climate of the city makes it a popular hot-weather resort. The population of Simla grows from about 27,500 to almost 45,000 when summer visitors come to the city.

Srinagar, *sree NUHG ahr* (population 207,787), the capital of the state of Kashmir, is located 170 miles northeast of Lahore, in the lovely Vale of Kashmir. High mountains rise behind the city, and near by are the beautiful Shalimar Gardens, built by the Moguls. British and Indian residents enjoy vacations spent in houseboats on the Jhelum River, which flows through Srinagar, and on the neighboring lakes. The chief manufactures of Srinagar are rugs, silver articles, wood carvings, attar of roses, paper, and leather goods.

Surat, *soo RAT* (population 171,443), a commercial city in the state of Bombay, near the western coast of India. Surat was at one time the headquarters of the British East India Company. The city lost much of its commercial importance when the East India Company moved to Bombay. But Surat is still a center for the manufacture of cotton materials and small metal ornaments. Grain and cotton are shipped from the city.

Social and Cultural Achievements

Social Conditions. In the early 1900's the average income per person in India was about twenty dollars a year. That average increased during World War II, but at the same time the cost of living rose at an even higher rate. There was a famine in many parts of India in 1942 and 1943 and the cost of food more than doubled. The low average income and the high cost of living result in a poor diet, bad housing, ill health, and little education for the average Indian.

World War II also brought with it some hope for betterment of the conditions of the Indian worker. Many Indians were given special training for skilled jobs in industry, and could draw higher wages. The labor-union movement is growing in India, and is bringing improved working conditions. In 1945 there were 666 trade unions in India, with more than 500,000 members.

The co-operative society movement is another source of improvement of working and living conditions. These co-operatives are of many kinds, from agricultural associations to co-operative banks and housing societies. They receive government aid and guidance. In 1945 about 123,000 agricultural co-operative societies in India had a total membership of nearly 5,000,000.

Education. Only about fifteen out of a hundred persons in India can read and write. Fewer than 3,600,000 Indians speak English, and many of these cannot read or write the language. But India has always passed on

VILLAGE AND CITY STREETS IN INDIA

Sawders

The Poverty and Hunger That Haunt Much of India are plainly visible in this street of thatched mud huts in a small village of northern India. The scanty clothing shows the thinness of the people, caused by insufficient food.

Gendreau

A Street Scene in Bombay, India's second largest city, on the Arabian Sea. The people of this seaport speak many different languages, and belong to a wide range of Oriental races. Hindus are the most numerous people of Bombay.

its culture by word of mouth. Many uneducated peasants can recite long passages from Indian classics by memory.

Education in India usually is a luxury for the well-to-do. Missionaries have set up schools for the poor, but these reach only a small number. Education by the government is haphazard. Most of the government schools are grade schools. Very few persons go to high school or college.

India and Pakistan have about 500 colleges, some of which are for women. There are nine federal universities, a Hindu university, a Moslem university, and universities in the states of Mysore, Hyderabad, and Travancore. These schools teach in English and in various languages of India.

Language and Literature. There are two main language groups in India. But there are many dialects of these. The Tamil-Telegu group is spoken in southern India. It is of Dravidian origin. The larger group — the Indo-Persian — is used everywhere in India except in the far south. There are several related languages within this group — Bengali, Gujerati, Marathi, Sindhi, Punjabi, Hindi, and Hindustani or Urdu. They come from ancient Sanskrit and have many Persian words in them. Many Moslems also speak Urdu as a second language if their own language is different. Most educated Hindus, except those in the extreme south of India, can speak Hindustani.

The Dravidian languages have a very rich literature. But the greatest Indian poetry is either in Sanskrit or Persian, or in one of the tongues that has come down from these languages. Not much Indian literature has been translated into English or other European languages. The literature which has been translated has proved to be full of beauty and color.

Arts. Indian culture and civilization are much older than those of Europe, but they have changed less through the years. Indian art has had three main sources—Dravidian, Aryan-Buddhist, and Islamic. The greatest arts of India are painting, architecture, tapestry, music, dancing, and sculpture. See ISLAMIC ARCHITECTURE; ISLAMIC ART.

Dravidian art is seen in much of the architecture of southern India. Dravidian buildings are heavily decorated and have much curious sculpture.

Aryan-Buddhist buildings are much simpler and more graceful. Their decoration is mostly in murals and stone mosaics. Many mural paintings of great beauty have been found in the caves and rock temples. Some Buddhist art also shows Greek influence.

Indians are fond of music, but their music is difficult for an American to appreciate. It is much like that of the rest of Asia in its use of a different scale which sounds off-pitch to a Westerner's ear. Wooden flutes, drums, cymbals, and many kinds of stringed instruments are common in Indian music. Music is often heard in the temples, where dancing has also been brought to a high art.

Ewing Galloway

A Sikh Policeman of the City of Jaipur. Sikhs are very proud of their beards, which their religion forbids them to cut. These people are members of a Hindu religious sect of northern India. They are strong and courageous, and have proved to be excellent soldiers in the British Indian Army.

Religion. The religions of India are important to the Indian way of life, and they were the chief reasons for the partition of the provinces when freedom was granted. The whole scheme of life of the Hindus and Moslems is governed by their religious rules. These rules affect health, clothing, food, and occupations.

The great religions of India are Hinduism or Brahmanism, Sikhism, Christianity, and Islam. Hinduism, Sikhism, and Buddhism originated in India. Islam was brought in from Persia and the Middle East. See BRAHMANIST; BUDDHIST; ISLAM; SIKH.

Caste System. One of the most important features of Hinduism is the *caste* system. This system divides the Hindus into separate classes, or castes. Members of different castes are not supposed to marry each other. They cannot even eat together. It is impossible for a man to change his caste. Certain occupations belong with certain castes. A Hindu finds it difficult to enter any occupation outside his caste. He tries to get on in his present life, but his efforts to advance himself are mainly directed to leading such a good life that he will be born again in a higher caste. See CASTE.

Caste rules are breaking down in modern times. Railway and bus travel makes for jostling together of various castes, and factory work brings different castes together. Many educated Hindus are also making definite efforts to break down the system. But progress is slow. The Dominion of India is making determined efforts to end the cruel treatment of the Untouchables. The Indian Assembly in 1947 outlawed "untouchability" and granted full citizenship to Untouchables. The Untouchables have never been physically mistreated, but they were forced to live apart and to do only the dirtiest and most poorly paid work. For thousands of years, they were not permitted to attend schools or to go into temples or other public places.

The Great Hindu Temple at Madura, in southern India, is one of the finest in the entire country. The two large towers in the background are covered with stone sculptures. These are found on most of the religious buildings of the Brahmanists.

Bronze Figure of the Hindu God Siva. His sacred dance, shown here, stands for the creative power of the universe.

Ewing Galloway; Cleveland Museum of Art; Sawders

The Hall of Heroes, a Hindu temple near Jodhpur in northwestern India. Its 16 carved statues represent gods and men.

In 1941, the leading religions in India had the following numbers of believers.

Hindus	255,030,506
Moslems	94,389,428
Christians	6,316,549
Sikhs	5,691,447
Jains	1,449,286
Buddhists	232,003
Parsees	114,890
Jews	22,480

In addition there are a number of tribes in the hill country who have their own special religions, which are usually varieties of Hinduism.

Before the partition of India, the Hindus lived in all sections and largely controlled political and commercial life. The Moslems centered in Bengal and in parts of northern India. Religious disputes played a large part in political struggles.

Buddhism started in India with Gautama Buddha, an Indian prince, who was born about 600 B.C. At one time almost all India was Buddhist, but the religion now ranks sixth in numbers of believers.

Jainism and Sikhism are reformist groups of Hindus, but they are very different from each other. Jainists are very strict in their way of living. They eat no meat, and many even wear a cloth over their mouths to keep from breathing in an insect and killing it accidentally. Sikhs revolted originally against the caste system. They are a warlike people, and many Sikhs are found in the Indian Army. They are also used as policemen in all parts of the British Empire. The men are very large and strong. See SIKH.

Health. The health of the people of India is poor compared with that of the peoples of Europe and America. Poverty, famine, bad diet, and unhealthy living conditions are partly responsible for the high death rate. Disease is spread by insects which most Hindus refuse to kill for religious reasons. Sanitation in many cities and in almost all villages is poor.

The average Indian can expect to live only 27 to 30 years, while the average citizen of the United States can look forward to a lifetime of more than 60 years.

Neither of the dominion governments has adequate public health service. Some improvement was made after the government reforms of 1935, when the ministries of the provincial governments were for the first time all Indian. The total sum spent on public health by the various government services is about twenty dollars per person a year. In 1945 there were 5,650 hospitals in India, with a total of only about 60,000 beds. This is a very small number to serve nearly 400,000,000 people.

Marriage Customs. Weddings in India have long been arranged by the parents. Child marriages were made illegal in 1929. But engagements are often made when the prospective bride and groom are still very young. The husband is the ruler of his household, but the women of modern India have more rights and privileges than Indian women used to have. The custom of *purdah*, or keeping women in seclusion, was brought to India by the Moslems. It is rapidly falling into disuse.

The custom of *suttee*, by which a widow kills herself after the death of her husband, has also disappeared. See SUTTEE.

History and Government

Prehistoric and Vedic Period. The earliest history of India is preserved in the ruins of a city at Mohenjo Daro, in the province of Sind. The city dates back more than five thousand years. Its remains indicate that its inhabitants had many improvements which were

Sawders

Counting and Examining Money in one of the leading banks in the city of Agra, India. The principal silver coin of the Indian Peninsula is the rupee, which is worth about 32 cents. A rupee contains about 165 grains of pure silver.

Neofot, Black Star

A School Orchestra of India, in which all the performers are girl students. Most of their instruments are Indian, but the violins are of European origin. Generally, only the children of prosperous families can go to high school or college.

Sawders

A Class in an Open-Air Islamic School in Punjab Province, Dominion of Pakistan. The pupils sit on the ground surrounding their teacher. A large part of the education of Islamic children comes from reading the Koran or reciting it aloud.

unknown to European people as late as the 1800's.

The city had wide streets, lined with brick buildings and apartment houses. Each dwelling had its own tiled bathroom. Covered drains ran through the city, and there were community swimming pools.

The inhabitants of the city are now known by the name of the Indus-Valley people. They had systems of writing, counting, weighing, and measuring. They dug ditches and canals through the land surrounding the city, to irrigate their farms. No one knows what happened to these early people. Their only record lies in the ruins of their city.

Invasion of the Aryans. About four thousand years ago, wandering bands of fair-skinned people came from the great plains of Central Asia down through the passes of the Himalayas into India. These people called themselves *Aryans*, which is a Sanskrit word meaning *noblemen*, or *owners of land*. Some of them stayed in India, to become the ancestors of many present-day Indians. Others wandered into Europe and became the ancestors of many present-day Europeans.

Roan-Miller, Black Star

Children of Calcutta, the Largest City of India. Most Indians are very fond of ornaments. This little girl wears bracelets, earrings, and a wire through a hole in her nostril. Even her baby brother wears bracelets.

The Aryans who settled in India found people there already. These were the Dravidians, a dark-skinned people of considerable culture. Other dark-skinned and more primitive people also were living in India at the time of the Aryan invasion. Many of the Dravidians moved ahead of the invading Aryans into the southern part of the country. Their descendants may be found today in Madras, Travancore, Cochin, and parts of Mysore. The primitive tribes took refuge in the hills and jungles, where their descendants still live much as they did.

Early Aryan Civilization. The influence of the Aryans gradually extended over all of India, although they never actually conquered the southern part of the country. During the first thousand years that they lived in India, the Aryans perfected the Sanskrit language and a way of writing it.

During this period, also, the Aryans invented the caste system, which has lasted through years of Indian history.

Democracy flourished in village republics all over early India. Village affairs were managed by a council of five elders, called the *panchayat*, who were chosen as the wisest of the community. The people of the villages farmed the land and supplied themselves with the necessities of life. They had little to do with the people of other communities because travel was difficult. Kingdoms and empires rose and fell in India, but the little villages lived in peace, and life went on there unchanged.

Dated history in India begins about 600 B.C. During the next hundred years Darius, the Persian, brought his armies into India but made no permanent conquests.

Two of the famous men of the very early period of India's history were the great grammarian, Panini, and the great religious teacher, Buddha.

Conquest of Alexander the Great. In 326 B.C. Alexander the Great invaded India and conquered the northwest part of the country. When Alexander and his armies left India, some of his generals remained as governors, or *satraps*, of the conquered land. Most of these were soon forced to leave. The few who stayed were taken into the governments of Indian kings.

Buddhist Period. The Maurya Empire was established after Alexander's departure, and spread until it included all India and part of central Asia. The most famous Maurya ruler was Emperor Asoka (272-232 B.C.). He conquered many neighboring tribes and took their lands to enlarge his own empire.

Asoka was suddenly converted to Buddhism, and waged no more wars after he was converted. Records of Asoka's rule still stand in the form of great stone pillars. The emperor had these pillars set up in every important city of his day, and he had orders and maxims carved on them. The carvings indicate that Asoka applied the doctrines of Buddhism to the rule of his great empire.

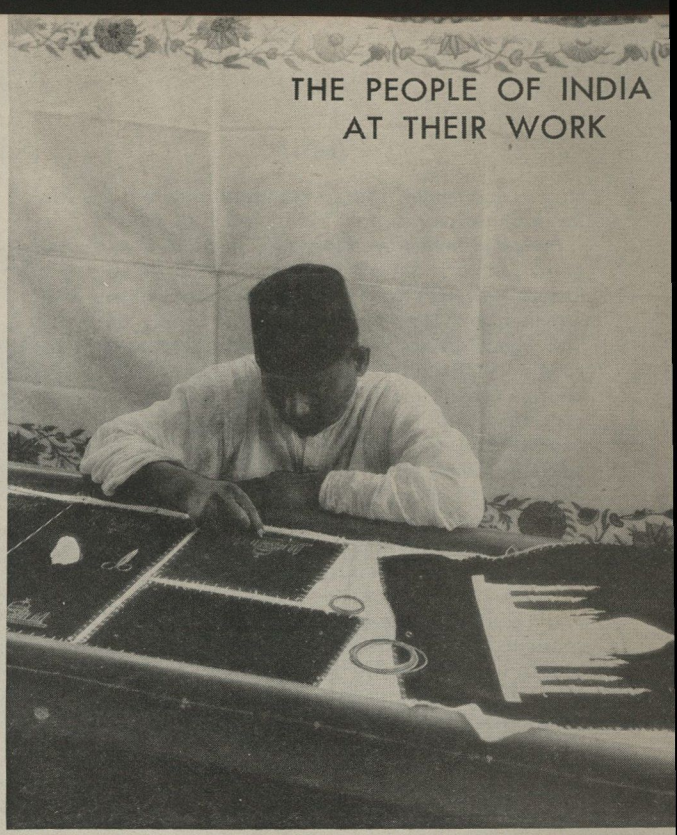
The Golden Age in India. After the reign of Asoka, India was invaded from time to time by Scythians, Arabs, Greeks, and Bactrians. About A.D. 120 the Scythians from Central Asia conquered northern India. Their kings ruled as the Kushan Dynasty. They were followed by native Indian emperors, the Gupta Dynasty. Each emperor enlarged his empire until finally the Guptas ruled over a territory which included all North India and parts of Afghanistan, and extended as far south as the Vindhya Mountains.

The Gupta period was the Golden Age of the Sanskrit Renaissance. India was a center of learning, art, and medicine. Rich and beautiful cities grew up, great universities were founded, and an advanced civilization flourished. Records of the period have been preserved.

A great civilization under the rule of the Andharas, Pallavas, and other Hindu-Buddhist dynasties flourished in southern India at the same time as the Gupta period in northern India. The South Indians were seafarers and colonizers. They established a great colonial

THE PEOPLE OF INDIA AT THEIR WORK

Child Workers in the City of Trichinopoly, sifting sand for plaster with a crude screen



An Embroidery Designer of Agra, marking cloth to be embroidered in gold and silver. The city of Agra is noted for this work.

Women Workers at a Salt Mine carrying basket-loads of crude salt for refining in the salt mill.

Ewing Galloway; Sawders

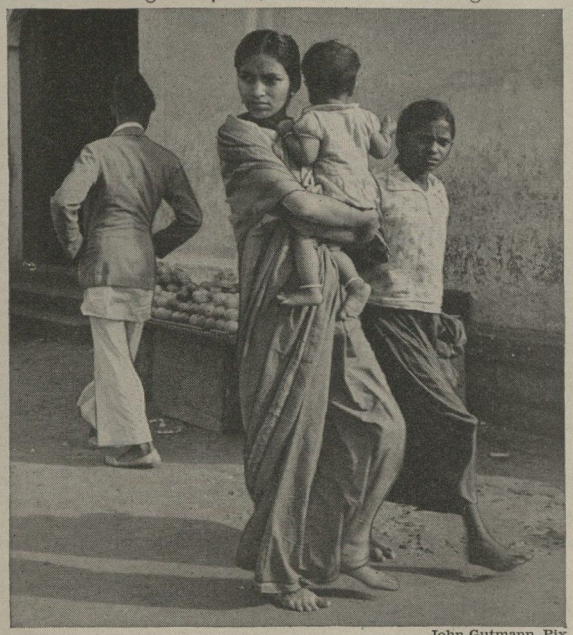
Making Hammered Brass Vessels in a Small Workshop in Delhi. Indian craftsmen are skilled in making elaborate designs.

empire and spread Indian culture throughout the Malay Archipelago, Burma, Siam, and Indo-China.

Period of Invasions. From A.D. 450 until near the end of the 1400's, India was attacked and invaded by many foreign powers. The Huns were the first to bring their armies into India. The Arabs came during the 700's, and the Persians in the 1000's. A Moslem sultanate established in Delhi in 1192 lasted until 1333. In 1398 Tamerlane and his Tartars raided India and destroyed the city of Delhi.

The Mogul Empire. Babar, the Moslem ruler of Kabul, came down into India in 1526 and won the battle of Panipat against a combined group of Indian kings and princes. The beginning of the Mogul Empire dates from the time Babar established himself as ruler of India.

Babar's grandson, Akbar, was the greatest of the Mogul rulers. He ruled from 1556 until 1605. This period started two years before and lasted two years longer than Queen Elizabeth's reign in England. Akbar conquered the Deccan and extended his rule over all India except the southernmost tip. He was a wise and good ruler. He undertook to break down the differences between his Moslem and Hindu subjects by encouraging intermarriage, by doing away with poll tax which everyone but Moslems had formerly had to pay, and by appointing Hindus as prime ministers, governors of provinces, and generals in his army.



John Gutmann, Pix

Indians in a Calcutta Street. The Hindus, facing the camera, have the well-proportioned features common among Indians. The woman carrying the child is wearing a sari, which is a single strip of cloth draped gracefully about the body. The fez of the man indicates that he is a Moslem.

During the 1600's the rule of the Mogul emperors was troubled by the fierce attacks of the Maratha tribesmen of west central India, under the leadership of Shivaji. Unrest within the empire developed from the rule of Aurangzeb, who became emperor in 1658. He was a narrow-minded and cruel ruler. His greatest ambitions were to purify Islam in India of all traces of outside influence, and to make as many converts to Islam as he possibly could — by the sword if necessary. Aurangzeb's narrow-mindedness and cruelty contributed to the breaking up of the Mogul Empire, which started to go to pieces at the time of his death in 1707.

The Coming of the Europeans. The Portuguese explorer, Vasco da Gama, had first reached Calicut in 1498. Portuguese settlers seized ports on the west coast of India during the early 1500's. Rivalry among European powers in Europe led to rivalry abroad, and French, Dutch, Portuguese, and English traders soon began a mad scramble for trade in the East.

The British East India Company was formed in 1600. At first its agents were merely traders, competing with other foreign traders. The Dutch settled in the Spice Islands, which they held for a while and later lost. The Portuguese made many early settlements, but lost them through laziness and inefficient governing methods. Part of Portuguese India was included in the dowry of Catherine of Braganza when she married Charles II of England. England and France gradually rose to the position where they were the only two powers concerned in the struggle for eastern trade.

The Rise of the East India Company. The European powers did not make great headway in India so long as the Mogul Empire was held together by efficient and popular rulers. But soon after Emperor Aurangzeb died, the Marathas gained possession of central and western India, Nadir Shah of Persia successfully raided northern India, and the Sikhs began to consider themselves a national group and strive for real power. Various small states tried to establish themselves as independent kingdoms. Many minor kings accepted help from the British East India Company, which always got the best of the bargain.

England became the leading power in India in 1757, when Robert Clive led the troops of the East India Company to victory in the battle of Plassey. In 1774 Warren Hastings was made the first governor general of India. But power was still in the hands of the East India Company, instead of the British Government.

The British East India Company extended its control over much of India almost before the Indians realized what was happening. Company agents used various means to gain additional power. They obtained the right to collect taxes, they stirred up one Indian prince against another, and they used Indian troops hired from one prince of India to subdue the troops of another prince — all for the benefit of the Company.

Between 1800 and 1857 the British East India Company used Indian as well as British troops to wage wars of annexation against Nepal, Burma, Afghanistan, the territory that is now Hyderabad state, and the Sikh state, which included the Punjab and Kashmir. Many of the people of India were reduced to poverty and bitterness by the greed of the Company, which aroused severe criticism in England.

In 1844 the British conquered Gwalior, a native state in central India. This state had been ruled since the early 1700's by Marathas rulers of the Sindia, or Scindia, family. Maharajah Dhiraj Scindia established neutrality between Great Britain and Gwalior by means of a

H. Armstrong Roberts; Hurlimann, Black Star

The Day Is Done for Indian Fishermen of Ceylon. After a day at sea the men pull their graceful fishing boats up onto the beach out of the reach of the waves. Birds perch on the rigging in hope of a discarded fish for dinner.

A Bearded Public Scribe helps an Indian who cannot read or write put his fingerprint on a contract in place of his signature.

A Trader in a Bazaar at Peshawar, India, takes time out for a refreshing bowl of tea.

treaty signed in 1782. The size of the state had shrunk steadily from the end of the 1700's until 1844, when Great Britain took it over.

Rebellion of 1857. The people of India rebelled in 1857. The immediate cause of the rebellion was that Indian soldiers were ordered to bite open cartridges which were greased with animal fats. The Hindu soldiers were angry at the order because their religious beliefs forbade them to taste meat or meat products. But the underlying causes of the rebellion were the deep discontent of the people, the attempt of the Mogul emperor to regain the power taken by the East India Company, and the desire of many Indians to win back the control of their own country.

The revolution failed through lack of organization, support, and leadership. But it came near enough to success that the agents of the Company were alarmed, and English and Indians alike were shocked at the violence of the movement. The cruelty with which the revolution was suppressed has been a source of bitterness in India ever since. See SEPOY REBELLION.

Government by Great Britain. After the Rebellion, the people of England felt that abusive rule of India by the East India Company must end. The British Government took over the rule of India in 1858, and power was placed directly in the hands of the British Parliament.

The British Government acquired direct control of all land already governed by the East India Company, plus the territories conquered during the Sepoy Rebellion. All this came to be known as British India.

Great Britain also gained indirect control over most of the rest of India. A few narrow strips of land along the southeastern coast of India remained under French control. Britain signed treaties with certain Indian rulers who had supported the East India Company during the Sepoy Rebellion. Certain other Indians were made rulers of various Indian territories, and were given titles in reward for the support they gave the British Government. The parts of India thus indirectly controlled by Great Britain were called the Indian States.

A Governor General, or Viceroy, was placed at the head of the Indian Government. This official was appointed by the British king and was made directly responsible to the Secretary of State for India, who was a member of the British Cabinet. Through this cabinet member, the governor general was also responsible to the British Parliament. The Indian Councils Act of 1861 gave the Viceroy of India a council made up of five British members, also appointed by the Crown.

Local Administration. The Government of Great Britain placed most of the Indian provinces under the local rule of governors. These governors were always British rather than Indian, and were appointed by the Crown. They were responsible to the Viceroy, and to the British Parliament.

Each of the Indian States was left to the rule of an Indian prince, who had absolute power in his own state. Each state also had a British Resident, appointed by the Viceroy. The Residents took little part in the affairs of the states. But the British government controlled the relations of the states with one another and with foreign countries. The Indian princes paid allegiance to Great Britain and were bound to support British interests in time of war. In return for their allegiance and support, the status of the princes as rulers was guaranteed by solemn treaties with the Crown. The princes also received protection from Great Britain against possible revolt of their own subjects.

Consolidation of British Rule. The British Government established its rule over India firmly in the years from 1858 to 1914. Queen Victoria was declared Empress of India at a magnificent ceremony, or durbar, held in Delhi in 1877. The northern boundary of India was established by the Second Afghan War (1878-1881), and in 1885 Burma was annexed to India as a result of the Third Burmese War.

The British installed railroad, telegraph, and telephone systems in India, and rebuilt and enlarged the Indian irrigation system. A system of famine relief was worked out which helped offset somewhat the terrible results of India's chronic poverty. The British gained a hold on the affections of many Indian people by their efforts to feed the starving millions during the famine of 1899. But the British Government in India still faced occasional native uprisings and many problems of government and control.

The Indian National Congress was founded in 1885 with the full approval of the British Government. It grew into a representative group which served as a sort of political debating society, where Indians could discuss their grievances. Members of the Congress come from every geographical section of India, and also from all religious groups and castes. Another political organization, the Moslem League, was founded in 1906. Its chief purpose has been to advance the cause of the Moslems in India.

In 1909 the system of Communal Electorates was begun. By this system Hindus and Moslems who had voting rights were permitted to vote only for candidates of their own religious communities. Also in 1909 the Morley-Minto Reforms enlarged the Viceroy's advisory council to seven members, one of whom was an Indian.

India After World War I. India supported Great Britain in World War I, and was promised a share in its own government as a reward. Some concessions were made in 1919, when the Montagu-Chelmsford Reforms changed the proportions of the Indian Council from six British and one Indian to four British and three Indians. The Central Legislature was divided into an upper and lower house, and the number of Indian legislators who might be elected to each house was increased. But the Indians were disappointed when the British Government passed certain repressive measures directed against India, instead of granting Indian independence.

These measures resulted in unrest and trouble among the Indians. These reached a climax in the Amritsar Massacre on April 13, 1919, when a British general ordered his troops to fire on an unarmed crowd gathered in an enclosure. Nearly four hundred Indians were killed. The general was officially reprimanded.

Struggle for Independence. After 1919 the history of India became an almost constant struggle on the part of Indians to gain their independence. Various constitutional reforms were passed, largely as a result of agitation by various Indian individuals and political organizations. In 1919 Mohandas K. Gandhi assumed

leadership of the Indian National Congress, which developed into a powerful political group.

Government of India Act. In 1935 the British Parliament set up a new constitution for India and made certain changes in the Indian government, based on the Government of India Act. This act provided for a Federation which would include the princes of the Indian states, as well as the governors of the provinces. The Federation did not materialize because most of the princes feared they might lose some of their local authority through this form of government.

The 1935 Act created provincial legislative assemblies, elected by about 11 per cent of the people. The Act further provided that each governor would form his cabinet from members of the majority party in the provincial assembly, and that all the cabinet members would be Indians. But the viceroy and the governors retained their powers of absolute veto over all legislative acts, and the central government kept most of the control of India's finances.

Burma and Aden were separated from India in 1937, as a result of the Government of India Act.

Mohammed Ali Jinnah took over the leadership of the All-India Moslem League in 1934. He sponsored a scheme called *Pakistan*, which means *Land of the Pure*, calling for an entirely separate Moslem state.

India and World War II. Indian resources were put to use by Great Britain and its allies during World War II. American and British air bases were established in India after the Japanese captured the Burma Road in 1942, and supplies were flown from India to China. India-based British troops waged a vigorous campaign against the Japanese in Burma.

By the end of 1943, India had become a huge supply base and training center for United Nations armies and air forces. The Japanese invaded eastern India in March, 1944. But British, Indian, and American forces drove the invaders back into Burma.

The Cripps Proposal. Soon after the outbreak of World War II, India asked for its independence as a reward for its aid in the conflict.

The British Government sent Sir Stafford Cripps to India in 1942. He attempted to solve the Indian problem with a plan known as the Cripps Proposal. The plan provided that India should be admitted to full dominion status, following the war, and be made a part of the British Commonwealth of Nations. Elected delegates from the provinces of British India and appointed delegates from Indian states ruled by princes were to draw up a constitution for a Federated Dominion of India. Any state or province had the right to remain outside the Federation and make its own treaty with Great Britain. Great Britain was to retain power during the war, and was to be responsible for India's defense.

The Cripps Proposal was rejected by all Indian parties because they felt it did not grant India a proper share of responsibility for its own defense. The Pakistan group thought the plan was too vague to satisfy their demands for a divided India. Anti-Pakistan elements opposed the suggestion that states or provinces, by their own choice, need not belong to the Federation.

Bombay Plan. Early in 1944 some of India's biggest industrialists drew up what is known as the Bombay Plan. This plan called for a fifteen-year step-up of industry, agriculture, education, and social legislation.

The Wavell Plan. The Viceroy of India, Viscount Wavell, called together representatives of the various Indian groups for a conference at Simla in 1945. The conference came after various Indian uprisings and movements which demanded that Great Britain leave India and its government to the Indians. The British tried to secure co-operation of all groups for the duration of the war with Japan, and until a permanent form of Indian government could be decided upon. The conference broke down when Mohammed Ali Jinnah demanded the Moslem League be allowed to name all Moslem representatives.

Seal of India

Postwar India. Following the end of World War II, various political and religious groups made different demands on the British Government, all centering around their desire for complete Indian independence.

Early in 1946 Clement Attlee, Prime Minister of Great Britain, offered complete independence to India as soon as Indian leaders could agree on a form of government for a free India.

From April to June, 1946, British Government leaders in India met with the leaders of Indian political and religious groups at New Delhi and Simla. Representatives of the Congress party and the Moslem League were unable to agree, and the meeting ended in failure.

Partition and After. Discussions were soon reopened. Indian political leaders differed on many points. Bloody Hindu-Moslem riots took place in the cities of India, and many persons were killed. In 1947, the partition of India was agreed upon as the only way to resolve the conflict among Indian peoples. India and Pakistan were made separate dominions in the British Commonwealth of Nations. A few Indian states governed by princes, such as Hyderabad and Kashmir, at first remained outside the Commonwealth. The partition was followed by much bloodshed. Whole villages were wiped out and roadside ditches were littered with dead after battles between Hindus and Moslems. Trains were choked with passengers as Hindus fled Pakistan and Moslems left the Dominion of India. By 1948, all the princely states of India had joined either the Dominion of India or the Dominion of Pakistan. But both dominion governments had many problems still to be solved. In 1949 India adopted an independent republican form of government but remained in the Commonwealth. The Republic of India's first national election was held in 1951. The same year the Government set up a five-year plan, costing over $3,500,000,000, to promote the country's industrialization. The United States Congress, in 1951, granted India a $190,000,000 loan to buy two million tons of American grain. In 1952 the U.S. gave India an outright grant of $50,000,000 toward its five-year plan.

H.W.B. and P.T.

Related Subjects. The reader is also referred to:

BIOGRAPHY (See also *History*)

Besant, Annie Wood
Bose, Jagadis Chandra, Sir
Brahma
Buddha
Gandhi, Mohandas Karamchand
Kipling, Rudyard
Mukerji, Dhan Gopal
Nehru, Jawaharlal and Motilal
Ranjit Singh
Tagore, Rabindranath, Sir

CHARACTERISTIC ANIMAL AND PLANT LIFE

Adjutant
Animal (color plate, India, South Asia, and East Indies)
Banyan Tree
Bo Tree
Cardamom
Cashmere Goat
Elephant
Flower (National Flowers)
Gaur
Rhinoceros
Water Buffalo
Zebra

CITIES

Ahmadabad
Bombay
Calcutta
Cawnpore
Darjeeling
Delhi
Hyderabad
Lahore
Lucknow
Madras
New Delhi

DIVISIONS

Agra and Oudh, United Provinces of
Assam
Baluchistan
Bengal
Bombay
Indore
Kashmir
Laccadive Islands
Mysore
Nepal
Nicobar Islands
Pakistan
Punjab
Rajputana

HISTORY

Afghanistan
Alexander the Great
Black Hole of Calcutta
Clive, Robert
Cripps, Richard Stafford, Sir
East India Company
Hastings, Warren
Nana Sahib
Sepoy Rebellion
Shah Jahan
Wavell, Archibald Percival, Viscount

LEADING PRODUCTS

Bamboo
Coal
Coffee
Cotton
Ebony
Indigo
Jute
Rice
Sugar Cane
Tea
Tobacco
Wheat

PHYSICAL FEATURES

Arabian Sea
Bengal, Bay of
Brahmaputra River
Ganges River
Gersoppa, Falls of
Ghats
Himalaya, The
Hindu Kush
Hooghly River
Indian Ocean
Indus River
Jumna River
Khyber Pass
Narbada River
Sutlej River

RELIGION

Ancestor Worship
Animal Worship
Animism
Ascetic
Brahmanist
Buddhist
Caste
Hindu
Islam
Parsee
Sikh
Transmigration of the Soul

UNCLASSIFIED

Asia (color plate, Lambadas Tribe, Hyderabad, India)
Bungalow
Durbar
Fakir
Flag (color plate, Flags of British Commonwealth of Nations)
Food (Favorite National Foods; Special Food of Many Lands)
Hindustan
Mahratta
Races of Man (color plate)
Rajah
Sanskrit Language and Literature
Shelter (Homes of India)
Suttee
Thug

Questions

From what does the name India come?

How does India compare in size with the United States?

Why are cattle seldom killed in India?

What are the *monsoons*? How do they affect India's climate?

Why is irrigation needed in India, although most of the country gets rain?

Where in India are the largest iron and steel works in the British Commonwealth of Nations?

In what two agricultural products does India lead the world?

What is meant by each of these: (a) dhoti, (b) sari, (c) tang pyjama, (d) selwar?

What is the Taj Mahal? Where is it located? Why was it built?

Why do many Indians make pilgrimages to Allahabad?

Who were the Aryans? How did they get control of India?

Who were the *satraps*? What happened to them?

What are the two main religions in India? How did religion influence the partition of India?

Why is India becoming more and more important in the world?

Why do the customs, beliefs, and ways of living differ in different parts of India?

What are two reasons the Ganges River is important to India?

What are India's chief natural resources? Why is farm production low, although the soil is rich?

Why are many Indian farms very small? How does the size of the farms affect farming methods?

For what handicrafts is India famous?

For what is the city of Darjeeling important?

How is the city of Jaipur different from other Indian cities?

How does the population of Simla change in summer? Why is this?

What important changes in the social conditions of India were brought about by World War II?

How has India handed down much of its culture from generation to generation?

Why may Indian music sound strange to western ears?

What is the *caste* system? How has it discouraged progress?

What are some of the reasons for poor health of many Indians?

What evidence is there that the Indus-Valley peoples of ancient times were progressive?

When was the British East India Company formed? How did it get control of India?

Why was the battle of Plassy important?

What were the causes of the Rebellion of 1857?

When and why did England take over India from the East India Company?

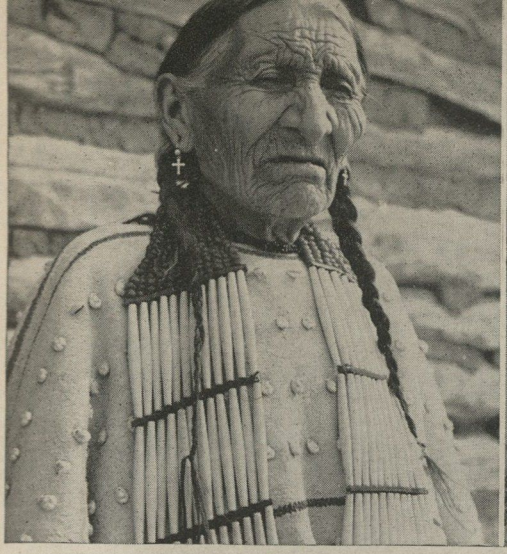
What important political advance did the Indians make in 1885? In 1909?

What were some of the provisions of the Government of India Act?

What was the Cripps proposal? Why was it rejected?

What was the Bombay plan? The Wavell Plan?

INDIA INK. See INK.



Rolf, Tietgens, Monkmeyer; H. Armstrong Roberts

INDIAN, AMERICAN. Columbus set out to seek India, and thought he had reached it when he found America. For this reason he called the natives he met Indians. Other early explorers called these first Americans *redskins*, because there seemed to be a little red in their brown color. Both of these names lasted, and both are still widely used. But Indians are not really red, and they have nothing to do with India.

The First Americans

The Indians could not tell Columbus their story, for they did not know it themselves. People today have begun to dig out parts of their story from the earth itself. Ancient bones of men and animals, stone tools, and the charcoal of campfires give us the hints of how they lived. The forms of rocks and the traces left by water and ice help to show the dates. But we can never know the whole story. The Indian past is a mystery thousands of years long, and modern scientists are working like detectives to find the answer. This is what they have found so far:

The Land Routes to the New World. Fifteen or twenty thousand years ago, long after early men had begun to live in the Old World, the New World was still an undiscovered land. Ice stretched down from the North Pole, covering the eastern part of America as far south as what is now Wisconsin. But some of the west was free from ice, especially in the valleys sheltered by mountains. Open land stretched along the Plains country which we now call Nebraska, up through the Mackenzie valley in Canada and the Yukon in Alaska. Other valleys in Siberia led into the heart of Asia. There was no Bering Strait to separate Siberia from Alaska. A bridge of land probably joined the Old World to the New.

Animals wandered across this bridge, seeking grass in the valleys. There was the huge mammoth, a kind of woolly elephant, whose tusks we still find in Alaska. There were big deer and an ancient kind of bison or buffalo. Perhaps the animals roamed in herds then, even as they did later. It may have been their tracks which led early men out of the Old World into the New.

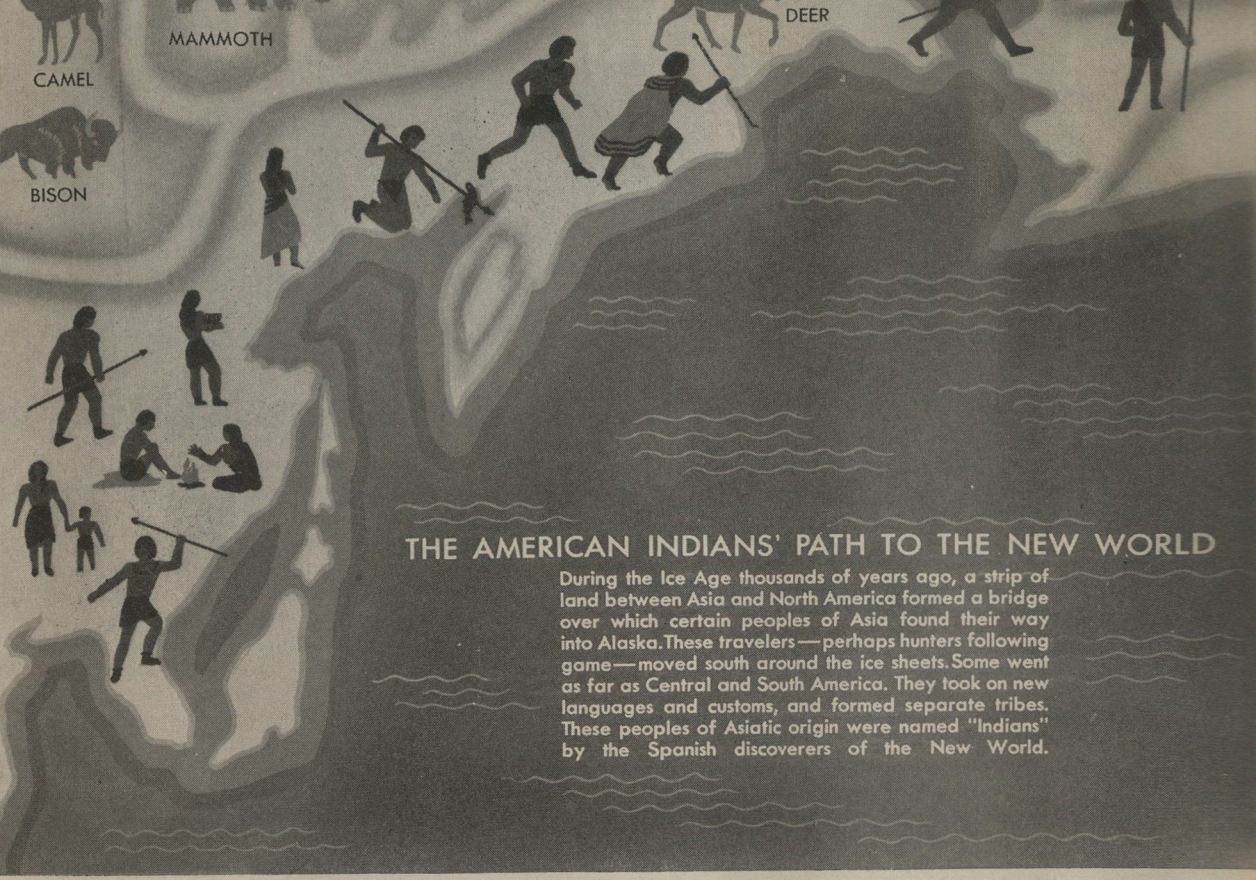
Ancestors of the Indians. Who were these early men? They came from Asia, but they were not like the Chinese or Mongolians or Koreans who live in Asia now. Perhaps they came from many parts of the Old World, and perhaps already they spoke different languages. We picture them as hunting people, dressed in skins. They carried stone-tipped spears which they threw with the help of a grooved board. The bow and arrow had not yet been invented. Even the dog, man's first animal friend, had not yet begun to follow their camps.

They tracked the animals across the Bering land bridge without knowing that they were entering a new continent. They spread down through our Plains country and into the Southwest. The deserts of New Mexico were then a green jungle. There they hunted the bison and left their spear points buried in its bones. More people followed them as the years passed. These later people brought dogs and bows and arrows. None of them traveled in great parties. Hunters can never do that, for fear of scaring the animals.

One hunting party after another moved along the ice-free route, camping, exploring, and raising families. Meanwhile the ice was melting a little year by year. North America became a country of rivers, lakes, and deep forests, even in places where there are deserts now. Finally, about ten thousand years ago, water covered the land bridge from Asia to North America and no more people could cross.

The First American Farmers. Now America was left to itself, and we do not know much about what happened for the next ten thousand years. The new people must have been exploring the two continents, finding every valley and river, hunting the animals and digging the plants. At last they found a seed which they could sow year after year and raise crops right at home. The seed was Indian corn. Of course they did not find the kind of corn we know now. There is no such thing as wild corn today. They must have found some kinds of wild corn plant which they cultivated and raised for thousands of years. No one knows where this happened. Perhaps many peoples raised many kinds of seeds, even different varieties of corn. At last the fat, nourishing ears from Peru, or perhaps Central America, turned out to be the best. Tribe after tribe learned about them and began to raise the great American plant—Indian corn.

Beans and squash soon followed. Now a new way of life was opened for some of the Indians. They no longer had to wander about as hunters. They could settle down, build permanent houses, and have time for crafts. They



could make the heavy pots which wanderers cannot carry. They could have regular ceremonies and organize a government. By the time Christ was born this way of life was beginning in Peru, Central America, and Mexico.

The knowledge of corn was even spreading to what is now the United States. We find hoards of the corn ears in the Ozarks, the Southwest, and the Mississippi Valley. In the next thousand years, large towns grew up in the last two places and were flourishing long before Columbus came. See PUEBLO.

Little by little, news of the new crops spread all through what is now the United States. The spread of corn shows how wrong is the saying that Indians always stick to their old ways and will not learn. When the white men came at last, they found that corn, beans, and squash were being grown as far north and west as possible. There was no part of the country which did not have them unless it was too cold or too dry, or the soil was too hard.

Indians who learned to grow crops did not give up hunting, for that was their only way of getting meat. Some Indians hunted for part of the year and farmed for the rest. Some lived in country where corn could not be raised, and they had to stick to hunting and seed gathering. A few spent practically all their time in farming.

It is a mistake to think that all Indians lived in the same way. Each group made the best of the land where its people lived, and that made a difference in their food, their houses, their arts and crafts, and their travel. There were six main groups of Indians in North America when the white men came.

Eastern Woodsmen

The Woodland country stretched north and south from Maine to Florida. It extended west to the Great Lakes and the Mississippi Valley and through most of Canada. Today, if you traveled through this country by train, you would see open farm lands and cities. But the first colonists in eastern North America always had to cut down trees before they could build their homes. Daniel Boone thought that all America was one great forest.

The names of many of the Indians who lived in these forests are famous in our history. In the cold north woods were the Chippewa, and Naskapi. Some of these Indians can be found there today. Along the Atlantic coast were the Massachusett, Pequot, Mohican, Delaware, and Powhatan. Along the Great Lakes were the mighty Iroquois and the Conestoga, and in the Mississippi Valley, the Illinois, Sauk, and Fox. These tribes were famous in the wars of Pontiac, Tecumseh, and Black Hawk. In the southern states were the Choctaw, the Cherokee, and the rest of the Five Civilized Tribes. See FIVE CIVILIZED TRIBES.

These Indians had a rich country, full of deer, beaver,

Reproduced by permission of Chicago Natural History Museum

and wild ducks. There were plenty of nuts and fruits. In the north there was some wild rice, as well as maple trees which they tapped for syrup. But they raised crops, also, as far north as Massachusetts.

Woodland Shelter. Their homes were built from forest materials. They could find fallen trunks of trees, or they could make a tree fall by burning it through. They had no metal axes, so they could not shape the trunks and build log cabins. But they could peel off the bark, and that is what they did. Homes in this woodland country were usually made of bark, and built in various shapes and sizes. Hunters of the Far North used a pointed tent, made of poles leaned together and covered with a wrapping of birch bark. Farther south the Indians built the wigwam, a dome-shaped frame of bent branches, covered with strips of tough elm bark. The Iroquois of New York made gabled frames, almost like a white man's barn, covered with strips of bark. In the south, the house frame might be covered with neatly woven mats of cane. There were all sorts of shelters and summer houses covered with mats or branches.

Woodland Clothing. Clothing was made of deerskin and, in the old days, it took very little sewing. The men had a breechcloth which the old settlers used to call "Indian breeches." This was just a long strip of skin which passed between the legs and hung down over a belt, both in front and in back. In warm weather this breechcloth and a pair of moccasins were all a man wore. In winter he had long deerskin leggings attached to the belt. Sometimes there was a shirt, made of a single skin, with a hole for the man's head. It was fastened roughly down the sides. Women wore a shorter shirt of the same kind, with knee-length leggings and a one-piece wrap-around skirt.

Not all Indians, or even all Woodland Indians, dressed alike. The Iroquois warrior had a special costume of a short deerskin kilt, which came halfway to his knees. In the south, men sometimes had robes of cloth—real cloth—which the women wove from milkweed fiber and painted in bright colors. They had plenty of ornaments. Necklaces were made of bear and elk teeth or of shells. Men painted their faces, especially in time of war or for a dance. They often shaved their heads, except for one lock. Young warriors pulled out all the other hairs with a clamshell, which they used as tweezers. They left one "scalp lock" on top of the head, and decorated it with feathers. Old men often let their hair grow as a sign of peace.

Woodland Crafts. The belongings of the Woodsmen, like their houses, were usually made from forest products. There were boxes and dishes of birch or elm bark, sewed together with grass. There were baskets made from strips of wood or cane. There were wooden bowls. There were mats of reed or of cedar bark. These Indians made some pottery, too, as all farming people did. You could soon learn to tell the tall gray jars of the northern Wood-

THE LEADING INDIAN CULTURE GROUPS

lands or the animal-shaped pottery of the southerners from the colored pottery made in the west.

Woodland Travel. In this thick forest country, travel was largely by canoe along the streams. There were many kinds of canoes, such as the birch bark of the north, the elm bark of the Iroquois, and the cedar dugout of the south. Some of these are still used. The birch-bark canoe is so light and graceful that the whites have copied it in canvas. The Indians used snowshoes and toboggans in the north, where streams froze in winter. Here again, whites have copied the Indians, for the snowshoes and toboggans sold in our sporting-goods stores today have about the same shape as those which Eastern Woodsmen used hundreds of years ago.

Hunters of the Plains

Now let us leave the Woodland. We cross the Mississippi, pass through the last stretches of forest on its western side, and come out on the open prairie. Here there are almost no streams for canoeing, and few trees for bark. But before the whites came, the Indians found plenty to eat. Vast herds of buffalo roamed over the grassy plain. They provided meat enough for all the Indian tribes and more. It was a wonderful country if you had horses to ride in pursuit of the galloping buffalo herds. But Indians did not have horses until the Spaniards brought them. So the Great Plains lay empty, except for some settlements up the rivers where corn could be raised. Between these big streams were wide, empty stretches where a man might die of thirst before he could walk to a water hole.

The Movement to the Plains. During the 1700's, Spanish conquerors brought horses to New Mexico. Tribe after tribe of Indians stole horses from the Spaniards or got them honestly by trading. As soon as the Indians got horses, they moved into the rich prairie land from all directions. Sioux and Cheyenne came in from the east, Blackfoot from the north, Ute from the west, Pawnee and Comanche from the south. A dozen other groups, speaking many languages, also entered the area. Some left their settled homes and became hunters in the new land. Others planted corn in the spring, rushed to the plains for the summer hunting, and came back home to harvest in the fall.

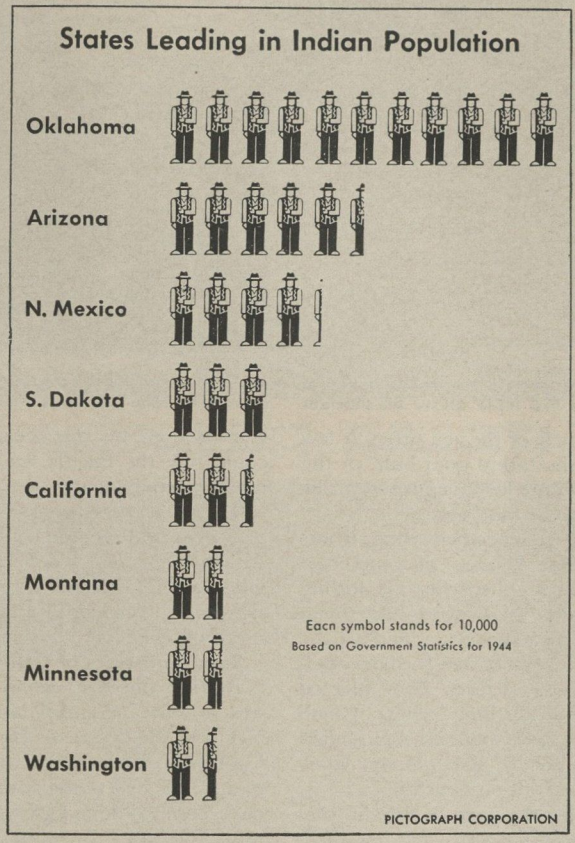
Food and Shelter on the Plains. The food of the plains was buffalo meat, fresh or dried, with some deer and wild fruits for variety. Tents, or *tipi*, were of buffalo hide. Plains Indians invented the famous tepee. First they made a foundation of tall leaning poles which came together at the top. The poles were covered with a wrapping of twelve or more buffalo hides, sewed into a half circle. Even the furnishings were made of hide. There were furry buffalo robes to sleep on. There were bags of scraped raw hide which folded up like an envelope and which were used for storing food. The warrior's shield, his arrow case, and his pipe case were made of buffalo hide. Usually there were no pots or baskets. Meat was roasted on sticks, or sometimes boiled in the stomach of a buffalo, hung over a low fire.

Clothing on the Plains. The clothing the Plains Indians wore was made from deerskin, for buffalo hide was too heavy for anything but winter robes or the soles of moccasins. Men wore breechcloth, leggings, and simple shirts just as the eastern Indians did, but they did not shave their heads. Their long black hair hung in two braids, which were sometimes padded with horsehair. The bravest chiefs had the right to wear a bonnet of eagle feathers. Many Indians now wear such bonnets,

but in early days they were like a general's stars or a war decoration. They could be worn by only a few persons and at certain times.

Women wore one-piece dresses, made of two skins fastened at the shoulders and down the sides. Their dresses were often trimmed with fringe and with dangling elk teeth. Sometimes they embroidered designs on their own clothes and on their husbands' clothes with colored porcupine quills.

Decorative work on skins was the great art of the Plains, for these travelers could not bother with carrying baskets or pottery. Women made beautiful bags and pouches of all kinds, which were sometimes quilled or beaded and sometimes painted in bright earth colors. Men painted skins and tepees with pictures of their deeds in war.



Travel on the Plains

Plains people were on the move all summer, following the buffalo. Every important man had herds of horses. He often had many more than he could use, for horses were a sign of wealth. The women of his family took down the tepees and made everything into bundles to be dragged behind the horses. They had no wagons, but they fastened poles on either side of a horse so that the ends dragged on the ground. A crosspiece was tied to these ends to form a sort of frame. The bundles were tied to the frame. For many years this frame has been called by a French name, *travois*. This was the name used by early French Canadian traders. Women and children rode the horses on homemade saddles which were often merely leather bags stuffed with hay. Men usually rode bareback. The Plains Indians did not often need boats, but now and then some of the tribes wanted to cross the Missouri. Then they used a tub-shaped boat made of willow branches and covered with buffalo hide.

Northern Fishermen

Across the Rockies which fence the Plains on the West, we find western lands of many different sorts. Let us move to the Pacific Coast, to the land of big trees. This extends from northern California into southern Alaska. It was a rich land from the Indian point of view, for it had plenty of food. Cold, clear salmon streams ran down from the hills to the Pacific. Every spring the great, oily fish came out of the ocean and crowded up these streams to lay their eggs. Indians had only to put out a net or a trap, and in a few weeks they could get enough food to last the year. There were halibut and whale in the ocean, elk in the forests, and plenty of roots and berries.

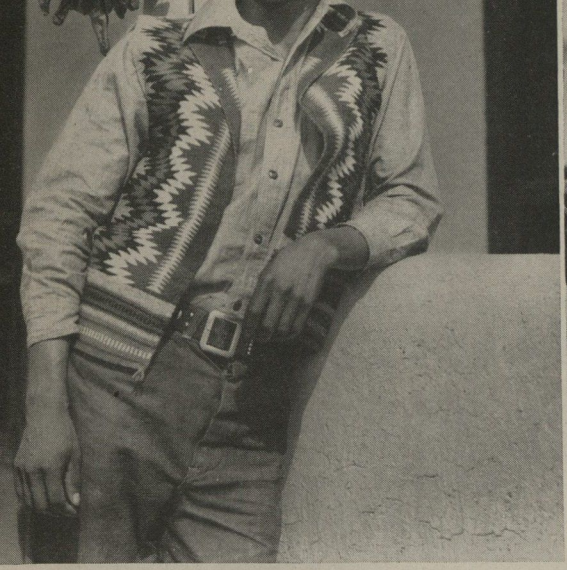
Here lived the Tlingit of Alaska, the Tsimshian, Haida, Kwakiutl, and Nootka of Canada, and the Chinook, Makah, and Puget Sound tribes of Oregon and Washington. Most of their country was too cold for corn, but they probably would not have bothered to raise it anyway when they had so much fish and game. They lived along the rivers where they had their salmon traps. A few skilled men hunted, and some went out in dugout canoes after whale.

Shelter in the North. The western Indians had another kind of wealth, not found in the rest of the country. That was the western red cedar, a tree so straight and easy to cut that the Indians could handle it with their stone tools. They burned through the trunks of trees to make them fall, then split them into planks with wedges of horn or wood. With these planks they built houses which look almost like modern barns. The planks were tied to the uprights with vines, and there were no chimneys or windows.

The first whites to visit this coast could not believe such buildings had been made by Indians. Some of the houses were more than fifty feet long. A raised platform ran along each side. These platforms were divided into compartments by hanging mats, and each house could hold eight or ten families. Dried salmon hung from the rafters, and the cooking fires were spaced along the earthen floor.

The houses were fragrant with the smell of drying herbs and roots, and with the scent of food cooking over the family fires. The earthen floors were swept clean with brooms made of twigs and branches, fastened together. Babies tumbled and played together on the floors of the houses, while their mothers did the cooking or sat weaving tight, well-made baskets. Some of the women worked at making clothes for themselves or for the men of the tribe. Others wove blankets or strung together the necklaces which everyone wore.

Clothing in the North. Even some clothing was made from the cedar. Women pounded the bark into shreds, and made short, fringed skirts for themselves. Men wore nothing at all in summer, but in winter they had robes



H. Armstrong Roberts

Indians of the Southwest. At the left is a Pueblo Indian of New Mexico. Dried hot peppers like those above his shoulder are a popular food both in Old and in New Mexico. At the right a Navaho squaw is feeding a young goat from a cup.

of bearskin or the fine, soft pelt of the sea otter. A few tribes wove blankets out of mountain goat hair, or the hair of little dogs raised especially for this purpose. Like most seashore people, they went barefoot.

When the western Indian used a head covering, it was not a feather bonnet but a hat. Women of some coast tribes wove big-brimmed hats out of spruce root, adding painted decorations. A Haida man who had given many feasts had a knob for each feast added to the crown of his hat. For decoration, coastal Indians often tattooed their faces with lines and dots. They pierced their ears in many places and had long strings of shell earrings. They wore necklaces of the pointed shell, called *dentalium*, which they used almost like money. They also used bear claws and elk teeth on necklaces.

Northern Crafts. The cedar tree gave wonderful material for craftwork. Men carved the soft wood into dishes and ladles to use at the great feasts they gave. They made wooden boxes by steaming the wood, then bending it and sewing it together with tough vines. They also carved images of the spirits. In Alaska and British Columbia these images were piled one upon another in the famous totem poles.

Women's work was basketry, and some of the best baskets in America were made in this region. The fishermen had no pots, so they even cooked in their baskets and boxes. The basket was filled with cold mush or soup, and hot stones from the campfire were dropped in until the liquid boiled.

Travel in the North. Cedar also gave the material for canoes. First the inside of a tree trunk was charred with a torch. Then it was hacked out with a stone knife. There were a dozen kinds of canoes. Special types were used for traveling, fishing, or fighting. Different canoes were used for travel on rivers and for travel on bays. Canoes used on the ocean were thirty feet long and could ride the Pacific waves more safely than a white man's whaleboat.

Tribes on the seacoast went whaling in canoes. They also went raiding, and some tribes, such as the Haida of Alaska, were real sea pirates. They attacked peaceful villages and brought home captives as slaves. These rich tribes were almost the only slaveholding Indians north of Mexico.

Seed Gatherers of California and the Great Basin

Beyond the Rockies which fence the Plains on the west is a dry and empty land. Here are the high plateaus of Utah, the deserts of Nevada, and the brown hills of California. Fruits grow in California now, but that is mainly because of the white man's irrigation. In Indian days, corn would not grow, for the region has no summer rain. The bare brown hills could not even support many deer, so that this stretch of country was one of the poorest in the United States. But some Indians lived even here.

The Paiute and Shoshone of Nevada, the Pomo and other tribes of central California, and the dozen or so little tribes which we now call Mission Indians were found in this region. Even the Ute of Utah and the Comanche of Texas lived in this seed country in the early days before they got horses. The tribal name of some of the Indians in this section came to be "Digger" from their habit of digging and looking for seeds.

In such a land there were few animals to hunt. Indians got some deer and antelope, but most of their meat came from the rabbits that hopped through the sagebrush. Where there were lakes, they found fish, ducks, and mud hens, but their chief food was nuts and seeds. The Pomo and Maidu in California practically lived on acorns. Modern people find an acorn too hard

Ewing Galloway

Hopi Indian Girls of Arizona, and some samples of their basketry. The Hopis are very skillful at this kind of handicraft and also at rugmaking. Tourists in southwestern United States eagerly buy these Hopi products as souvenirs.

U. S. Indian Service

Indian Artists of the Kiowa Tribe, which once inhabited the Great Plains, but now lives in Oklahoma. The drawings of warriors of the tribe were made as sketches for mural paintings in the Department of the Interior Building, Washington, D.C.

and bitter to eat, but the Indians pounded it into flour with a stone, then washed out the bitter taste with water. Paiute and Shoshone gathered the sweet nuts that grow on a dwarf pine called *piñon*. Others gathered seeds from such wild plants as primrose and pigweed. This work was done by the women.

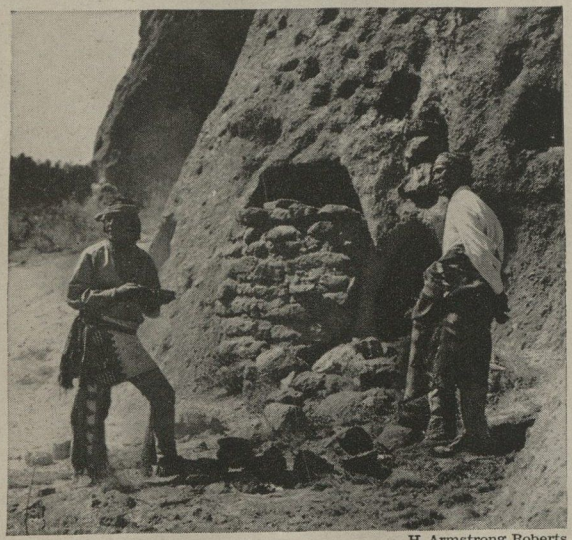
Shelters of the Seed Gatherers. Most of these Indians tramped over the country on a regular route each year, gathering each kind of seed as it ripened. Every family had two or three camps which it visited each year. The Indians put up a frame of poles, generally in a round or "beehive" shape. They had no bark or skins to cover it, so they tied on bunches of grass or desert bushes. In winter they heaped earth over the house. The thick walls kept it as warm as a modern basement.

Clothing of the Seed Gatherers. They made their clothing from the desert plants. Women pounded the bark of the tough little sagebrush or the desert willow into strings. From these they made breechcloths for the men. These were like a long narrow mat, fringed at each end.

For themselves, the women made two little aprons of fringe, a short one to wear in front and a longer one for the back. They rarely wore moccasins except for long journeys, but for snowy weather they had a sort of galosh made of twisted sagebrush. Their winter wrap was a big, square mantle, or cloak, woven from strips of rabbit fur.

Crafts of the Seed Gatherers. Few of the seed gatherers made any pottery. Their great art was basketry. Everything possible was woven from the desert plants. The baby had a wickerwork cradleboard, and his mother's cap was a little basket shaped like a bowl. Baskets were used for cooking acorn mush and seed gruel, as well as for carrying, winnowing, and storage.

Beautiful baskets were used as gifts and as offerings to the dead. In some Pomo baskets, the stitches were so fine that the material looked like cloth. Some baskets were covered with bright bird feathers and dangling shells. The people of this poor country made the best of the materials they had, and did it so well that they rank among the outstanding basketmakers of America.



H. Armstrong Roberts

Where Indians Once Lived. Two Indians of the present time are shown at the entrances to cave dwellings in New Mexico. Indians lived in these cave homes long before Columbus discovered America. The small dents in the face of the cliff provided footholds for climbing to the upper caves.

Village Dwellers of the Southwest

Moving south from Nevada, we come to Arizona and New Mexico. This land has a few green river valleys. Elsewhere it is as dry as the country of the seed gatherers. But it has one great blessing — summer rain. The Indians could grow corn here. This region is on the edge of Mexico, and the people knew how to raise corn early. Hard little nubbins of corn were probably being raised in southern Arizona at the time Christ was born.

Villages grew up quickly in this country. Some of those at the north are still in existence. We call these Indians Pueblos, from the Spanish word *pueblo* which means *village*. The villages are still occupied by different tribes, such as the Zuñi, the Hopi, the Keresans, and the Tanoans. Since ancient times all have been peaceful people who made their whole living by farming.

These tribes had no trees or animal skins for housebuilding, so they used the desert earth and the desert rocks. They made great terraced houses, four and five stories high which were like nothing else in North America. Besides their food crops they raised cotton and wove cotton garments—breechcloths and blankets for the men and blanket dresses for the women. Later, when the Spaniards brought sheep, they wove garments of wool. They dyed the wool yarn in beautiful colors made from the wild plants around them. They were famous potters, and even today you can buy their handsome jars in plain, shiny black or in black, white, and red.

Farther south there were other farmers. The Pagago and Pima Indians lived near the Gila River, and the Mohave and Yuma in Arizona. We are still working out the history of these interesting people, who may have been farming even before the Pueblos. Until a short time ago they lived in big, dome-shaped houses, made of poles and brush and covered with earth. Now many build houses of adobe brick, in the Mexican style. They made coarse red pottery, and the Papago and Pima used to weave cotton. These last two tribes have kept the art of basketry, and their handsome black and white baskets are sold throughout the United States.

Nomads of the Southwest

The Southwest is full of Indians. You see more old dwellings and ancient ceremonies there than anywhere else in the United States. Besides the village dwellers, there are wanderers — the Navaho and Apache. Scientists say that these tribes came down from the northwest a few hundred years ago. Most other Indians who speak their language live in Canada and Alaska.

When these tribes arrived, they were hunters. They dressed in skins or cedar bark. The Navaho settled near the Pueblos, and learned to raise corn and to weave cotton. After the Spaniards came, they got sheep and became great shepherds. Now we think of a Navaho family as owning a flock of sheep and galloping over the desert on little Spanish horses. See NAVAHO.

stitches were so
n. Some baskets
rs and dangling
made the best of
well that they
kers of America.

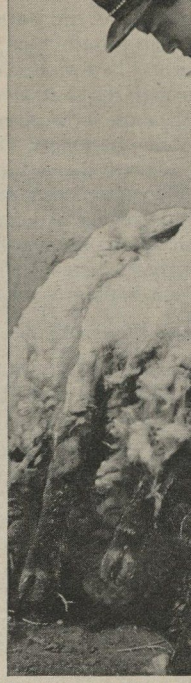
outhwest

e to Arizona and
een river valleys.
the seed gather-
mmer rain. The
on is on the edge
raise corn early.
bly being raised
was born.
ountry. Some of
e. We call these
ord *pueblo* which
pied by different
he Keresans, and
have been peace-
g by farming.
l skins for house-
h and the desert
ses, four and five
g else in North
hey raised cotton
oths and blankets
he women. Later,
ey wove garments
n beautiful colors
them. They were
n buy their hand-
ck, white, and red.
ners. The Pagago
la River, and the
re still working out
e, who may have
Until a short time
houses, made of
earth. Now many
exican style. They
ago and Pima used
s have kept the art
and white baskets
es.

west

You see more old
ere than anywhere
he village dwellers,
nd Apache. Scien-
from the northwest
Indians who speak
Alaska.
vere hunters. They
Navaho settled near
n and to weave cot-
got sheep and be-
k of a Navaho fam-
oping over the des-
VAHO.

A Weaver Beginning a Navaho Rug. Each rug, though skillfully patterned, is made with an intentional flaw. A perfect design is considered unlucky.



Shearing a Sheep
Columbus's time, shee

Handicrafts of the Pueblo Indians of New Mexico. In early days, making pottery was considered women's work.

H. Armstrong Roberts; U

Tiny Beads Make Ornamental H
are popular now, but were unknow

Their kinsmen, the Apache, did not settle down like the Navaho. Few of them raised crops at first, for they liked hunting and raiding better. In former days their tribes had camped through the southwestern mountains and down into Mexico, some in brush huts like those of the seed gatherers, some in tepees like those of the Plains Indians. Most of them dressed in skins and rode horses on their raids. They had time for crafts, too. Some worked with the tanned skins of animals, and some learned basketry from their peaceful Pima neighbors. (See APACHE.) Besides these, there were other wandering groups of different speech, like the Yavapai and Walapai.

Indian Ways of Life

It is clear that America, in Indian days, had many different ways of life. We have talked about only the most typical ones. The more we study Indians the more differences we can find. In each case, however, the way of life was the most sensible to be found, considering what materials the Indians had.

Indians did not live in pointed houses or round houses because they were queer people. Their reason was that these were the easiest shapes to make or the most convenient to carry. When white pioneers had to live in these forests and deserts, they often found that the most sensible thing they could do was to copy the customs of the Indians.

Crafts, Old and New. Indian crafts used all the materials that were at hand. Indians have been criticized because they did not beautify their homes and because they rarely do so, even now. But home, for an Indian, was only a sleeping place, and it was often changed or left behind. The Indian man and his wife spent their time and effort on the things they would keep always, such as their baskets, pots, and robes, and other crafts.

You can tell what kind of craftwork a tribe did when you know where they lived. People of grassy or wooded country made baskets. Farming people preferred to make pots. The hunters did their best craftwork in skins. A few who had plenty of food and leisure went on to such arts as weaving and wood carving.

Great progress was made in all these arts when the whites came. You may have thought that beadwork and totem poles were old Indian arts. But really they were impossible without the white man's beads and steel tools. Weaving was also improved when the whites brought wool and bright-colored dyes.

Painting was another old art which developed greatly after the whites came. Plains Indians had done some painting on smooth buffalo hide. The Southwesterners had made paintings on the plastered walls of their buildings. When the whites brought paper and bright water colors, Indians really showed what they could do. Their striking pictures have been exhibited all over the United States and in Canada and Europe.

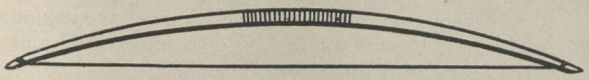
Indians also learned some brand new white man's arts, like silverwork. Two hundred years ago, eastern Indians began to imitate the work of the English, and they still keep some beautiful old pieces made at that time. A hundred years ago the Indians of the Southwest began to learn silverwork from the Mexicans. They combined their own ideas with those of the whites to make beautiful designs which have become famous.

Tools and Weapons. Before the whites came, tools were made of wood, bone, and stone. Seacoast people also used shell. Each man made his own tools, and he was always on the lookout for suitable stones which he would make into tools in his spare time. This work was

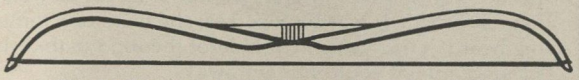
H. Armstrong Roberts

Two Types of Indian Homes. At the left is a house of the Pueblo Indians of the southwestern United States. Early Pueblos sometimes built stone or adobe houses high on mesas or rock ledges. There they were protected from hostile attack. The houses were several stories high, with flat roofs and ladders instead of staircases. At the right is a Navaho house, called a "hogan." The earth with which it is covered helps to keep it warm in winter and cool in summer. The planks and hewn logs at the doorway were not used in early hogans, because the Indians had no axes or other iron tools.

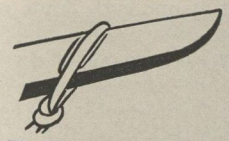
INDIAN BOWS AND ARROWS



The Indians of the Eastern Forests made their bows from one piece of wood. Hickory, oak, and ash were used, and the string and handgrip were of sinew.

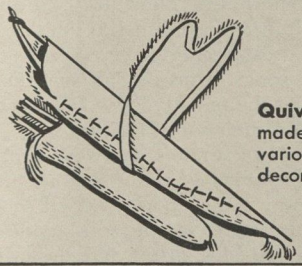


The Indians of the Plains and Deserts made bows from driftwood, horn, and bone. They were jointed, pieced together, and held firmly by sinew.

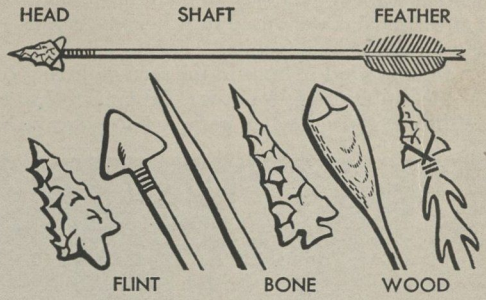


The Bowstring fits into notches. One end is tied and the other is looped.

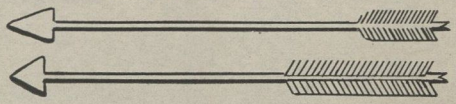
Thongs of Leather or sinew were used to bind arrowheads to the shaft.



Quivers and Bow Cases were made from the skins and hides of various animals, and were highly decorated.



Arrowheads were made of many different materials. The type of arrowhead depended on the locality of the tribe.



The Arrow used by the Northwest Indians had a long shaft and a short feather. The Plains Indians made an arrow with a short shaft and a long feather.

Flint Arrowheads were made by chipping the stone to a point with the antler of a deer.

a long job. It meant first hacking the stone into shape with another stone, then chipping it to a sharp edge, or else grinding it smooth with the aid of sand and water.

Hammers and Axes. Two kinds of stones could be used. Tough ones like granite, which would not split, were used for the pounding tools such as hammer and ax. Every tribe had a hammer, even if it was only a chunk of stone. But there were few axes. At best, the Indians could only hack at logs. They could not shape logs with their crude axes as they could have with metal axes. But the Northwesterners, who did much woodwork, made adzes out of smooth, hard serpentine, or out of jade. Women ground corn by rubbing small stones up and down over large flat stones.

Arrowheads and Scrapers. The second kind of stone was the kind that splits, as ice does when you thrust in an ice pick. Some stones that will split are flint, chert, and the black volcanic glass called obsidian. This type of stone was used for all cutting tools. To make them, the worker placed the edge of his stone on a piece of wood, set a bone chisel against it, and hammered until a chip flew off. After knocking off a row of chips, he had a cutting edge somewhat like the jagged edge on some modern bread knives. A long stone chipped in this way was a knife. Shorter ones were skin scrapers, spearheads, and arrowheads.

Farm and Household Tools. Bone tools were easier to make, for bone breaks into sharp slivers. Some of these slivers were used for awls and some for chisels. A whole antler was sometimes used as a pick, to dig out the native copper or turquoise. A shoulder blade was often made into a hoe.

Many of these tools had handles. The stone tool was usually grooved or cut in some way, and then fitted inside a forked stick. Some Indians bound the fork with twisted plant fiber. However, all Indians preferred animal sinew when they could get it, for sinew shrinks when it gets dry. They put it on wet, winding it as tightly as they could. The sinew shrank tighter as it dried, and became hard as wire.

There were also some wooden tools, such as the long pointed stick used for planting. Sometimes this had a fork near one end. The forking branch was cut off, and the crotch was used for a footrest. There was also a wooden hoe, shaped like a sword and sharpened along one edge. The worker knelt and pulled this along the

ground, cutting off the tops of the harmful weeds.

Traps and Nets. Traps and nets should probably be included in a discussion of Indian tools, for the Indians used them in many ways. They twisted the cord from the inner bark of trees or from plant fiber and made nets of all sizes. Nets were used in water to catch fish, or on land for ducks and rabbits.

A famous kind of hunt in the seed-gathering country was the rabbit drive. A net was strung across some narrow place, and everyone gathered to scare up rabbits

H. Armstrong Roberts

A Family Group of Seminole Indians of southern Florida. These swamp-dwellers find an occupation and a source of money in hunting alligators and preparing their skins for sale.

and drive them into the net. They did the same with ducks when the flights went over in the spring and fall. There were all sorts of traps made of wood, such as the pens into which the game was driven or the spring traps and deadfalls which dropped a weight on the animal or caught its foot in a noose.

Probably the Indians got more food with nets and traps than they did with bow and arrow or hook and line. Some Indians used fishhooks, made of bone or sharpened wood. Some tribes speared fish, and the Northwesterners harpooned them. Many hunted game with bow and arrow. The method simply depended on circumstances.

Bows and Arrows. Bows and arrows were brought by some of the latest Indians to come to America. These weapons were of various shapes, depending on what wood a hunter could get. Men who went on foot often used bows six feet high and with very little curve. The bowstring was often made of twisted plant fiber. Shorter bows had more curve, and the string was of deer sinew. Horsemen used a very short bow, sometimes with the double curve we call a Cupid's bow. Shorter bows had to be very strong. They often had lengths of sinew glued along the back to make them stronger and help them withstand the spring.

Arrows were usually about three feet long. They were made of a light, straight wood, and sometimes of reed. Each tribe had its own way of putting on the tail feathers. Indians sometimes used two and sometimes three feathers on each arrow. If the arrow was for small game, its tip was only sharpened wood. If it was meant to kill deer or men, the tip was of stone. Arrows were valuable, and a man usually marked his own so he could pick it up and use it again.

Some Indians used a spear. This was a six-foot shaft with a large stone tip. It was good in fighting, in buffalo hunting, or in giving the last blow to a harpooned whale.

Harpoons were used only in the Northwest and the Arctic. The harpoon was like a spear or an arrow with a rope attached. It was thrown from the hand or a throwing board. The hunter kept hold of the rope so that the speared animal could not get away.

The spears and arrows used for hunting were also used for war and fighting. Fighters sometimes used another weapon, the club. Often this was just a heavy piece of wood with a knot at one end. Some eastern tribes got the idea of setting a sharp stone point in the knot. This made the famous *tomahawk*, an Algonkian Indian word. When white traders came, they saw what a good weapon the tomahawk was and began to make it with a steel point. Finally, it developed into a neat little ax.

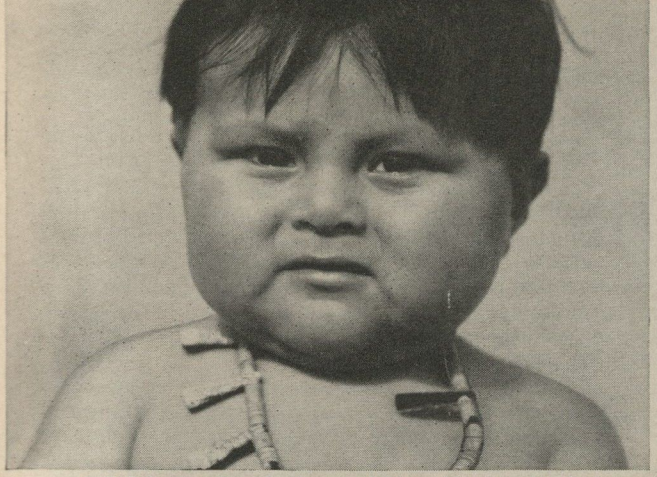
Poetry and Music. Indians had poetry and music, though these are not well known. Their poetry did not rhyme. It was like our free verse, in musical lines of different lengths. Some of it was recited in ceremonies, but much is to be found in songs. These songs were not in parts. All the voices sang the melody. The Indians did not use many notes, and their songs had no short, repeated tune. The lines had a few notes, and were of many different lengths in a complicated pattern. Sometimes extra syllables without any meaning were added within a line to give it the right length for the song required.

Musical instruments were the drum and the rattle. Many tribes used flutes, but these did not actually play a tune. They only gave birdlike notes, and were played mostly by the young men in courting. Rhythm instruments were very common. Drums could be made of a hide stretched over a wooden frame like a tambourine, or over two frames like our drum. Sometimes the hide was stretched over a pot of water. A heavy hide might be folded up hard as a board and beaten with sticks by several men.

Northwest Indians pounded with sticks on a board or on the rafters. Rattles were made from gourds or hard bags of buffalo hide, or from tortoise shells filled with pebbles. The Indians also used a sort of castanet made from bunches of little rattling objects, such as deer hoofs, bird beaks, or cocoons.

Languages, Signs, and Smoke Signals

The various Indian groups speak hundreds of different languages. At first sight, each language seems quite different from any other. Indians had no written language before the whites came. The picture-sign used in parts of Mexico expressed general ideas rather than regular sentences. But scholars have been studying the Indian languages for more than fifty years and have



A Child of a Pueblo Tribe of New Mexico. His dark eyes and straight black hair are typical of most Indians.

The Cradleboard on which this Indian baby is strapped allows his mother to carry him conveniently on her back.

These Navaho Boys have learned English in one of the Federal Government's special schools for Indians.

The Canopy on the Cradleboard protects this Indian baby from the sun, but not from the friendly attentions of the lamb.

A Navaho Girl and Her Lamb. The Indians' first domestic animals were brought to America by white men.

H. Armstrong Roberts; U.S. Indian Service; Milton Snow, Navajo Service

A Day's Water Supply for an Indian Family. This Apache girl and her donkey must travel far to bring back water from the nearest reservoir in dry Arizona.

gathered them into a number of language families. A family, in this sense, is a group of languages with similar grammar and with many words which have come from the same roots. Thus, almost all the European languages form one family, from Sanskrit and Greek, down through Russian, French, German, and English. When we know that Indians, north of the Mexican border, had some dozen great families of this sort, we can see how absurd it is to speak of the Indian language as though there were only one.

Language Families and Confederacies. As study goes on, some of the families appear to be distantly related. Scholars at present believe there are six groups or superfamilies, some containing as many as five or ten families and thirty or forty tribes. The list below gives the larger and better known families in each group, and tells their location on the most recently made maps.

Algonkian (taking its name from the little Algonkin tribe on the Ottawa River) is one of the largest and best-known language groups. The group is sometimes known as the Algonquian. Its members occupy all eastern Canada, as well as parts of the eastern coast of the United States and the Mississippi Valley. Some pioneer members, the Blackfoot, Cheyenne, and Arapaho, have even reached the Plains. See TABLE OF TRIBES.

The Algonkians were the first Indians whom the English colonists met. Our language today contains many of their words, changed to suit English tongues. These include *wigwam*, *tomahawk*, *wampum*, *squaw*, *papoose*, *hominy*, *succotash*, *skunk*, and *woodchuck*. A map of eastern North America would be blank indeed if we cut out the Algonkian place names, such as Adirondack, Connecticut, Ottawa, Mississippi, Wisconsin, and hundreds of others. Salish, the language of the other large family in this group, is spoken on both sides of the Canadian border, from the Pacific Coast to Idaho. The word *potlatch*, used for the famous Indian giveaway feast of the Northwest, comes from a third family of this group, the Wakashan.

Athapascan is another large and famous language group or superfamily, made up mostly of northern hunting tribes. These stretch from the interior of Alaska down through western Canada, with a few fishing groups in California and Oregon. The most adventurous members of the family, the Navaho and Apache, have reached our Southwest. It is interesting to know that the Tlingit and Haida, famous totem-pole builders and canoemen of Alaska and Canada, are relatives of these southern horsemen.

Uto-Aztecan. This western language family stretches along the plateau country from Oregon to Mexico City. It has been named from its northern and southern members, the Utes and the Aztecs. It includes a variety of small families, the Shoshonean (including such tribes as the Hopi, Paiute, Ute, and Comanche), Piman (Pima, Papago), and, perhaps, a recently named family, Pueblo-Aztecan, which includes the Aztec of Mexico, the Kiowa of the Plains, and all the Pueblos except Hopi, which is Shoshonean.

Sahaptin, Penutian, Tsimshian, Chinook. This group takes in a number of small families, mostly near the Pacific Coast.

Siouan is not only the language of the famous Dakota Sioux, but that of their corn-raising relatives in the Mississippi Valley, such as the Osage, Omaha, and Missouri. A few smaller groups, such as the Catawba, are in the Southeast. The Siouan word tepee (*tipi*), which means a dwelling place, has been taken into the English. It means the pointed skin tent used by the Dakota Sioux. It is interesting to find that the Siouan language, with its nasal sounds, is related to that of the mighty Iroquois of New York. Other relatives are the Caddoans (such as the Pawnee and Wichita) and the Muskhogeans, now among the Five Civilized Tribes of Oklahoma. These four, together with their scattered smaller relatives, make a family almost as large as the Algonkian.

Eskimo and Aleut. This superfamily is described in two separate articles, entitled ALEUT and ESKIMO.

Indian Vocabulary. You may sometimes see the statement that Indian languages contain only a few hundred words. Nothing could be farther from the truth. Indians often lump a number of ideas into one word so that it becomes practically a whole sentence. Thus Wintu, a California language, uses one short word meaning *She-is-dress-striped*, where English would use six words: *She has stripes on her dress*.

On the other hand, Indians often have several different words to describe varieties of one thing. You could not ask a Papago the word for arrow, for he would want to know "Do you mean war arrow, or hunting arrow?" An Eskimo has no one word for seal. His nouns mean seal-basking-on-the-ice, seal-swimming, seal-eating-fish, old-seal, young-seal, and other ideas important to a hunter.

Indian Grammars are complicated even though their rules are not written down. For instance, we think of the plural as simply meaning more than one thing. Some Indian languages, however, have two plurals, one meaning *things bunched together*, like a pile of corn, and the other *things scattered around*, like grazing buffalo. Pronouns are different from those in English, and there is no *he* and *she*. The Indian makes whites laugh by saying: "My wife, he." The laughers would be puzzled indeed if they had to use the third person singular in Maidu, which distinguishes *the-one-near-me*, *the-one-near-you*, *the-one-far-away-but-in-sight*, *the-one-far-away-out-of-sight*. Indians have so many expressions describing the exact position and shape of things that they often find English very indefinite.

Finger Signs. Indians from very different language families often met for trade, so they had to work out some way to understand each other. There were several famous trade languages. The best known trade language was the Chinook of the Northwest coast. Beginning with some common words in Chinook, they added words from other Indian languages and finally, from French and English.

On the Plains, the Indians worked out a system of signs, made with the hands. Thus, *tepee* was two fingers held in pointed shape. The sign for *buffalo* was the first finger held at the side of the head like a horn. There were signs for the name of each tribe, like touching the foot and then something black for *Blackfoot*, or imitating the horned hair arrangement of the Pawnee.

There was also a system of signs so that scouts could signal the home tribe from a distance. Running back and forth on some prominent hill meant that the enemy was sighted. Holding up the blanket and bringing it down with both hands meant *buffalo herd*.

For a greater distance, smoke signals were used. A smoky fire was made and the blanket waved above it so that the smoke came out in puffs. The number and spacing of the smoke puffs had various meanings, much like taps on a telegraph instrument. After the whites had brought mirrors, Indians flashed signals with these.

H. Armstrong Roberts

A Tipi, or Pointed Tent-Dwelling of the Plains Indians. Tipis were formerly made of buffalo hides stretched over poles. The loose flaps at the top can be opened or shut to provide ventilation for the cooking fire within the tent.

Family Life

Indian men and women each had their own work and did not interfere with each other. Men had charge of hunting and war. In most tribes, this took their full time. Among the corn growers, men helped a little with the crops, but women did most of the work while their husbands were away. It was only among the Pueblos, where there was little hunting, that men did all the farm work. Women took charge of the home and often built it. They cooked, took care of the babies, and did nearly all work that could be carried on near the house, such as pottery and basketry. Plains women, who made no pots or baskets, used to carry back the meat their husbands had killed, butcher it, and dress the skins to make leather.

When hunting and war were given up, women's work went on just the same, but men's work stopped. The Indian man was often called lazy, for he could not get used to the kinds of work white men did.

Children. The Indian child spent the first year of his life on a cradleboard. This was a flat piece of wood or wickerwork as long as the child. Sometimes it had a little awning of basketry or buckskin. The baby was tied to this board on a mat of soft bark or grass. In this way, his mother could carry him about while she worked, without hurting his tender back. All babies seem to like this system, and no one has found that it hurts their health.

The child had plenty of playmates. Usually a number of his relatives lived together. The household might include not only father and mother, but grandfather, grandmother, and several uncles and aunts with all their children. The small children played about, wearing no clothes at all. They helped with such work as bringing sticks for the fire, and they learned to be silent and respectful before older people. By the age of about eight they were wearing clothes like their parents. Then the boys began to follow the men at their work while the girls stayed with the women.

When children reached the age of fourteen or so they were ready to be men and women. At this age, boys often went out into the desert or the forest, hoping that a spirit would speak to them and promise help for their future life. In some eastern tribes girls also did this. More often, when a girl reached maidenhood, it was the proper thing for her to stay alone in a separate house under the care of some old woman. Some northwestern tribes kept her separate like this for six months. More often the time was four days. Then came a ceremony, dance or feast, and she was ready for marriage.

Marriage. Indian young people did not choose their own mates. This was done by the parents, or perhaps by the whole family. In some tribes a girl came to live with her husband's family, and in others the man lived with his wife's people. The family always made sure that the

new husband or wife would be hard-working and well-behaved. Gifts were exchanged on both sides.

The wedding ceremony was very simple. Often there was none at all. But there were special rules for the behavior of the young couple, especially if a man went to his wife's family. In some tribes which had this custom he had to show respect for the mother-in-law by never meeting her face to face or speaking to her. The wife carried gifts and kind messages between them. The Indians said that this arrangement prevented quarrels.

Tribal Life

The Clans. Some Indian tribes were divided into clans. A clan was a group of persons all descended from the same ancestor. Sometimes the descent went through men, as it does with the whites. When we speak of the Jones family, we mean all who were born to the name of Jones. We do not think of the Jones girls who married into some other family and whose children bear some other name. Yet these children, too, are descended from the original Jones. Some tribes had what we might call father-clans, whose descent went down in this way.

Other tribes counted descent through the mother. Then it was the boys who went away when they married, and *their* children belonged to the wife's clan. In any case, all clan members thought of themselves as brothers and sisters. They never married each other and they were always ready to give help, even to a "brother" they had never seen.

Sometimes a tribe was divided into halves, with a number of its clans in one half and the rest in the other. These halves helped each other in ceremonies and often played games against each other. No one could marry into his own half but must choose someone from the other half. All this helped a person to feel that he had friends and a place in the world. It must have been a fine thing for people wandering and fighting in a strange land.

The Indians themselves rarely thought of such a thing as a tribe. They knew that there were a number of people who spoke the same language and lived in about the same way and who did not fight each other. This is what we call a tribe, but usually it was not organized into a nation. Only a few eastern groups like the Iroquois, the Cherokee, and some others had a real tribal government. Other "tribes" split up into little groups, each of which looked after itself.

Chiefs in War and Peace. These little groups were sometimes villages and sometimes wandering bands. They usually had a leader whom we call a chief. Often he had others to help him. Still, he was not like a king who could make the people do his will. He was more like a father and teacher who advised the people and tried to make things smooth.

The real power was in the council, which usually included all the grown men of the tribe. When they were not hunting, they might meet every night and talk over the problems of the village. They never took action unless they were all agreed. If some disagreed, they did not take a vote. They simply dropped the matter.

White people had a hard time understanding this. They were always expecting that the chief could answer for all his people. And they could not wait for a council to agree. They did not understand that they were seeing a real democracy, a truer democracy than many of them had ever known. The Indian groups were so small that they did not need to have elections or vote on questions. They knew the will of the people simply by talking it over in their nightly meetings.

They needed a different plan when it came to war. Then the kindly old leader often gave place to a war chief. Some groups chose a war chief only when they needed him. Some let him volunteer. Some kept a permanent war chief and a permanent peace chief, though the war chief had nothing to do except when trouble came up. This puzzled the whites, too. They would find that a war chief had gathered a number of people who wanted to fight. The whites supposed that this chief could rule the tribe, and force them to keep any agreements he might make. They could not believe that the Indians were a peaceful people and would not obey the war chief except when they were planning a fight.

Indian Ways of Fighting. The Indians had frequent little fights, especially when they were moving and clashing with other tribes. But these were a matter of a raid once or twice a year in which perhaps a dozen men took part. A few night bombings in World War II probably killed more people than all the Indian wars in history, for the unorganized tribes could not raise large armies. It is true that, after the whites came, many tribes got together in desperation, trying to match the numbers that came against them. But in Old Indian days only the Iroquois and a few eastern groups could gather warriors by the hundred. The others used tactics like those of the Commando or Ranger party. They would steal up on a village or camp, wait until the inhabitants were all asleep, and make a sudden attack. They burned the dwellings and killed everyone they met, even women and children. Then they hurried away before their own men could be killed off. Some groups took scalps or captives to show what they had done, while others did not.

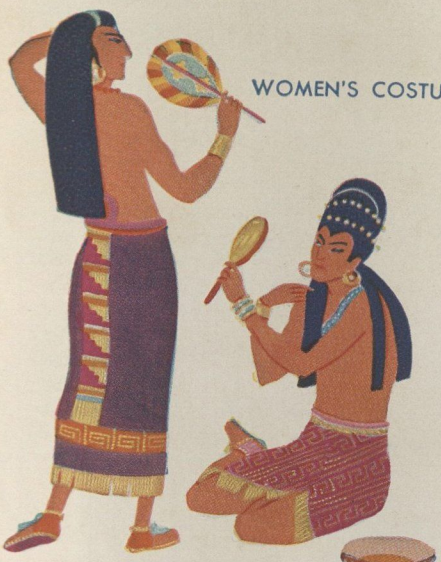
Were the Indians Cruel? The European settlers who came to America thought the Indian kind of warfare savage. They regarded the Indians as an especially cruel people. Yet the pages of the white man's history are filled with examples of killing beside which the raids and wars of the Indians seem quite unimportant.

The Indians had to make quick raids, or they would lose their own few men. They usually had no time to choose whom they would kill and whom they would not kill. Unlike the whites in their country, they were not trying to rule the enemy or take his land. All they wanted was to scare him away so he would leave them in peace. That was their plan with white settlers, too. They found it hard to believe that a number of scalpings and burnings would not scare the invader away forever. They had no idea how many whites there were.

Slaves and Captives. Many tribes took captives and treated them in different ways. The rich Northwesterners used them as slaves, for they could easily feed them and use them in housework. Some of the eastern tribes used captives in farm work, though often they treated them as members of the family rather than servants.

The Iroquois and some of the southern tribes kept women captives, but sometimes tortured the men they

MAYA INDIANS



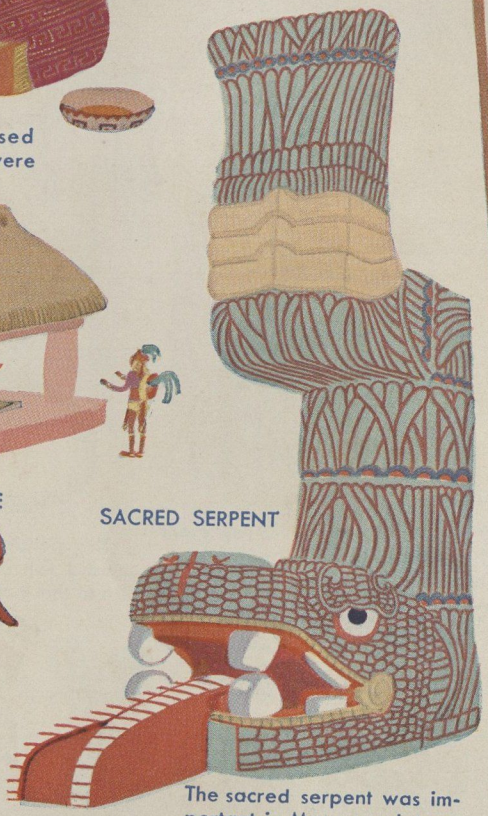
WOMEN'S COSTUMES

The hair was carefully dressed Jeweled pins and ornaments were used to hold it in place.

CHIEFTAIN

The chief wore a head-dress adorned with the feathers of the quetzal. He carried a staff and a feather fan.

A MAYAN HOME



SACRED SERPENT

The sacred serpent was important in Mayan sculpture.

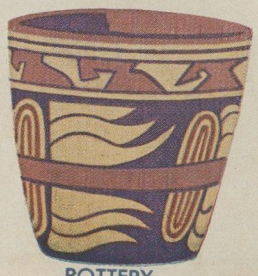
LIMESTONE HEAD

Carvings in stone were used only in the service of the gods of the tribes.

MAYAN WARRIOR

TEMPLE OF THE WARRIORS

Long, wide stairways led up to the beautiful temples.



POTTERY

Inca homes were built of granite. They were thatched with reeds and grass.

Llamas were used as pack animals.

Vases were made to represent gods, spirits, and heroes.

THE QUIPU

This pendant was used for counting into the thousands.

A COSTUMES

woven from wool and llama.

re made of beaten gold.

MARRIAGE CEREMONY

The chief stood between the two persons to be married, called them by name, and joined their hands together.

TEPOZTECA

Was one the gods agricultu

Pottery wa mixing qua

An Obs

A hut with thatched roof
WARRIORS
Warriors wore elaborate costumes with feather headdresses and feather robes.
TEPOZTECATL
Was one of the gods of agriculture
A CHIEFTAIN
AZTEC CANOE
Canoes were usually made from logs. They were hollowed out by burning. Canoes were used for transportation and in many religious ceremonies.
A JADE ORNAMENT
CEREMONY OF HUMAN SACRIFICE
GOLD JEWELRY
Pottery was made by mixing quartz and clay.
An Obsidian Mirror
The bravest prisoner of war was sacrificed each year. On the day of his death, he played a flute in the parade. Priests and four beautiful girls walked with him.

Algonquin Indians lived in round or oval wigwams. A framework of saplings was covered with slabs of elm bark.

The birchbark canoe was used on lakes.

ALGONQUIN WOMAN

Women's dresses were made of deerskin, with many fringes.

ALGONQUIN WARRIOR

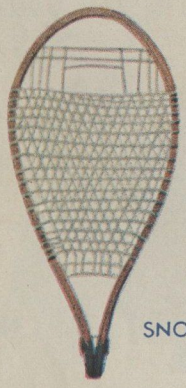
The hunter traveled light in summer. He wore a breech-cloth, and a gay feather in his hair.

BIRCHBARK BOX

This was used to hold food, trinkets, and other objects. The edges were sewn together by splitting the tender roots of the spruce tree.

WOVEN BAG

Bags were made of fiber and buffalo wool. They were used for keeping sacred objects.



SNOWSHOES

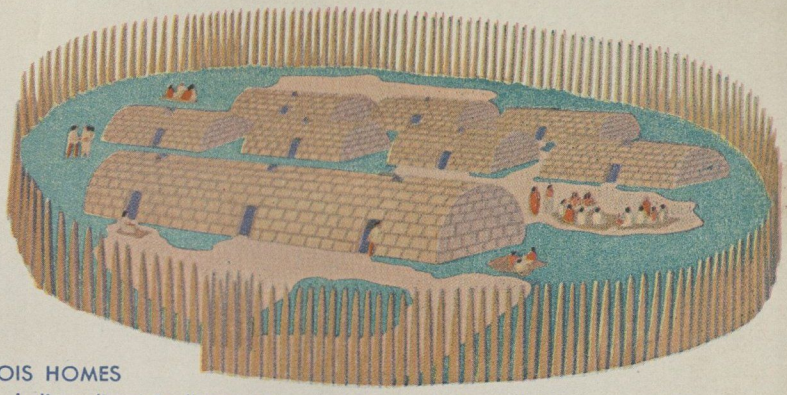
The frames were made from tough wood, and laced with rawhide cords.

THE CALUMET DANCE

As they take part in this dance, the Algonquin Indians ask the Great Spirit to give them a good corn crop.

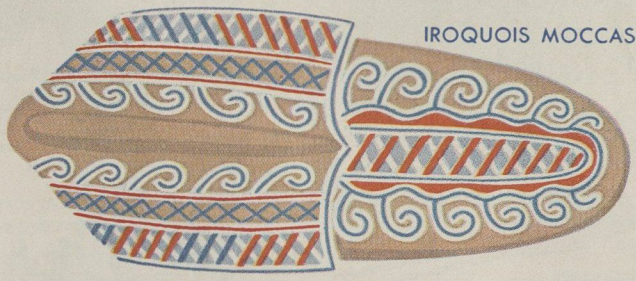
SENECA WARRIOR

This costume was worn around 1800. The warrior is holding a war club.



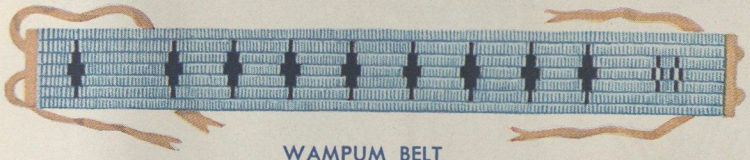
IROQUOIS HOMES

Iroquois Indians lived in "long houses" placed within stockades from 15 to 20 feet high. Several families lived in the same house.



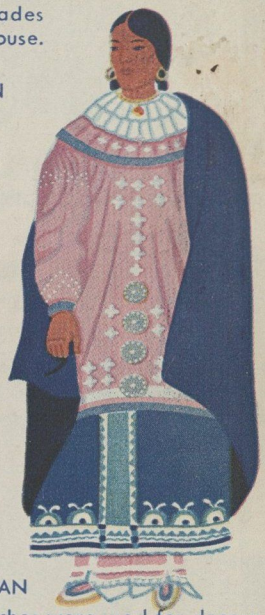
IROQUOIS MOCCASIN

The Iroquois made moccasins of deerskin or mooseskin. The designs were embroidered with moose hair, porcupine quills, and beads.



WAMPUM BELT

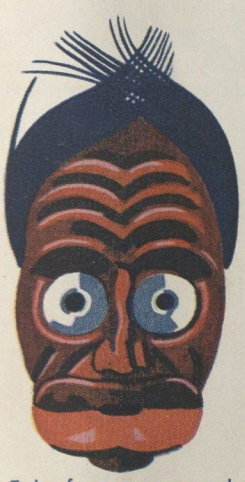
Wampum belts were used when treaties were made. White beads meant peace and friendship. Purple beads stood for war, death, or mourning. Wampum had high value and was also used for money.



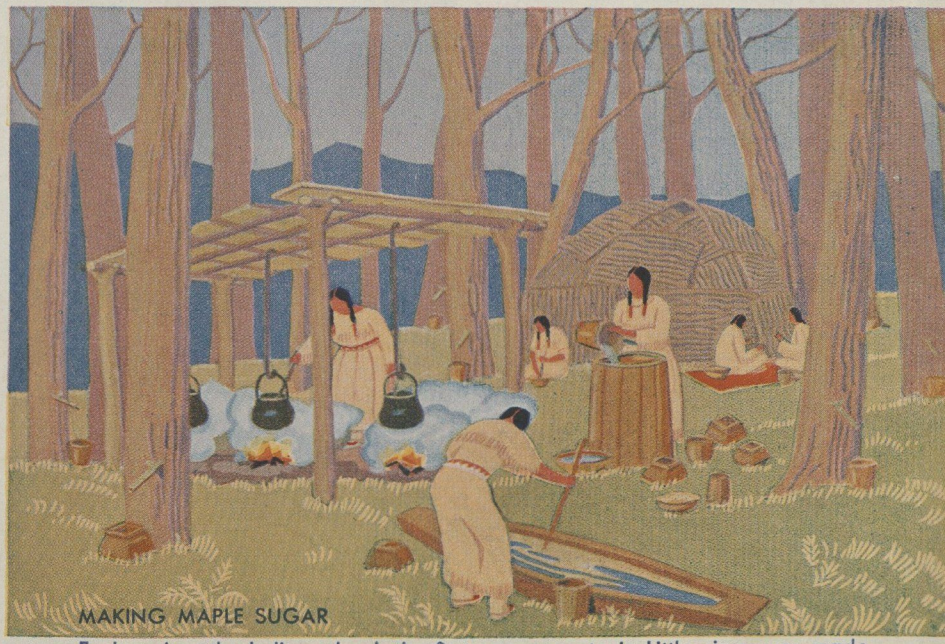
SENECA WOMAN

Beads and silver brooches were used for decoration, and a mantle was worn over the shoulder.

FALSE FACE



False faces were worn by medicine men. The basswood masks were said to drive away evil spirits.



MAKING MAPLE SUGAR

Each spring, the Indians drank the first sap as a tonic. Little sirup was made.

IRAN AND AFGHANISTAN
1 Inch = 126 Statute Miles
Miles 50 0 50 100
National Capital
Size of symbols and type indicates relative population
Lambert Conformal Conic Projection
RELIEF
Feet
5 000
2 000
1 000
500
Sea Level
Below Sea Level
500
5 000
COSMO RELIEF IRAN
Copyright by RAND McNALLY & COMPANY
Made in U. S. A.
Longitude East of Greenwich
SOVIET UNION
AZERBAIDZHAN
ARMENIA
TURKEY
Baku
Caspian Sea
85 Ft. Below Sea Level
Tabriz
AZERBAIJAN
Tehran
Hamadan
KURDISTAN
KERMANSHAH
LURISTAN
Baghdad
IRAQ
KHUZISTAN
Isfahan
IRAN (PERSIA)
TURKMEN SOVIET UNION
UZBEK SOVIET UNION
TADZHIK
AFGHANISTAN
PAKISTAN
INDIA
Kabul
Kandahar
Herat
Mashhad
Meshed
Ashkhabad
Samarkand
Bukhara
Tashkurghan
Mazar-i-Sharif
Shiraz
Kerman
Yezd
Zahidan
Quetta
Karachi
Hyderabad
BALUCHISTAN
KUWAIT
SAUDI ARABIA
QATAR
OMAN
TRUCIAL OMAN
Persian Gulf
Gulf of Oman
Arabian Sea
Prepared expressly for THE WORLD BOOK ENCYCLOPEDIA

Maidani, Cape, Iran....I 9
Marun R., Iran.....F 4
Mashkel R., Iran.....H11
Mil Kuh (Mtn.), Afg...E10
Miyan Kaleh Peninsula, Iran.....C 6
Murdab (Bay), Iran....C 4
Murghab R., Afg.....D12
Naband, Cape, Iran...H 6
Namak-Sar, Lake, see Daryacheh-i-Namakzar
Oman, Gulf of, Iran....I 8
Paropamisus Range, Afg.....D12
Persepolis (Ruins), Iran.....G 6
Persian Gulf, Iran.....G 4
Puzim, Cape, Iran.....I10
Qais Isl., Iran.....H 6
Qara Chai R., Iran.....D 5
Qishm Isl., Iran.....H 7
Qizil Uzun R., Iran.....C 4
Qum R., Iran.....E 5
Rabch R., Iran.....I 9
Sefid R., Iran.....C 4
Shah Fuladi (Mtn.), Afg.....D13
Shahi (Isl.), Iran.....C 2
Shah R., Iran.....C 5
Shaikh Shu'aib (Isl.), Iran.....H 6
Shatt al 'Arab R., Iraq.....F 3
Shir Kuh (Mtn.), Iran.....F 7
Shur R., Iran.....D 5
Shur R., Iran.....F 7
Shur R., Iran.....F10
Shur R., Iran.....H 7
Siah Band (Mtn.), Afg.....E11
Sirri (Isl.), Iran.....I 7
Susa (Ruins), Iran.....E 3
Takht-i-Sulaiman (Mtn.), Iran.....C 5
Tank, Cape, Iran.....I 9
Tigris R., Iraq.....E 2
Tumurisk (Sand), Iran.....D 8
Tunb (Isl.), Iran.....H 7
Tuzlu (Lake), Iran....D 4
Urmia (Lake), Iran....C 2
Ushturinan Kuh (Mtn.), Iran.....E 4
Zagros (Mts,), Iran....E 3
Zaindeh R., Iran.....E 5
Zardeh Kuh (Mtn.), Iran.....E 5
Zuhreh R., Iran.....F 5

portant part of Iranian life. His capital, Isfahan, was known in his day as the most beautiful city in the world. Safawid rule ended with the reign of Nadir Shah in the 1700's. Nadir Shah was the last Iranian conqueror. His forces overran Turkey and northern India. After his death, the Kajars became the rulers.

The Modern Period. The 1800's and 1900's were a period of increasing advances by the countries of Western Europe. The British conquered India, and wanted to gain control of Iran and Iraq as protection against the growing power of Russia. But the Russians took over the whole foreign trade of Iran with the Treaty of Turkmanchai in 1828. Russia gradually took possession of the northern districts of Iran. The opening of the Suez Canal made Iran more important than ever to Britain. In 1907 the Russians and British agreed to divide Iran into two "spheres of influence" for trade.

Meanwhile foreign merchants and missionaries were bringing Western ideas into Iran. The Iranians wanted a constitutional government like that of Great Britain. In 1906 the Shah granted the people a constitution which provided the representative form of government which Iran still has. But the king continued to hold the real power. The Kajar Shahs, who were gradually losing their power, tried to play off Russia against Britain. When Germany began its career of conquest, they tried to play off both Russia and Britain against Germany. The discovery of oil in 1908 made Iran still more important to other countries.

During World War I, battles between Turkey and the Allies took place in Iran. The Germans tried to stir up the Iranians against Russia and England, but failed. Iran had a period of freedom from Russian pressure after the war. The Soviet Government was having trouble with outside interference in its own country, and withdrew its forces from Iran. For this reason, Iran took advantage of the Russian withdrawal to demand better terms from Great Britain for British use of Iranian oil. British interests gradually took control of Iran. But in a few years a new king, Riza Khan, rose to power in Iran and began to enforce a policy of Iran for the Iranians.

Riza Khan was an army officer. He organized his troops so well that he soon had the whole country under his control. The Iranians deposed the last Kajar Shah and set up Riza as the new Shah in 1925. Riza created a fine army by drafting men, established a civil service, and appointed all the higher officials himself. Roads and railways were built.

Iran announced its neutrality when World War II broke out, and tried to maintain that neutrality. But the Allies needed Iran's oil, and its new railway, which was almost the only possible way to send supplies into the Soviet Union. The Allies invaded Iran and forced Riza Shah to abdicate. His son, Mohammed, became Shah. Iran became one of the United Nations, and declared war on the Axis countries. Riza was taken to the British island of Mauritius, and later to South Africa, where he died in 1944.

After the war, British and American troops were withdrawn, but the Soviet Union refused to withdraw its forces until Iran signed an agreement to permit Russian development of the oil resources in the northwestern province of Azerbaijan. Iran appealed to the United Nations, accusing the Soviet Union of inciting revolution in the province. On order of the United Nations, all Soviet troops were withdrawn from Iran by early May, 1946.

However, extreme nationalist groups, and also the outlawed Tudeh, or Communist, party provoked hostilities against Great Britain and other Western Powers. Neither large sums of American money received under the U.S. Point Four program, nor the fact that the Shah split up his estates to be sold as farms to the peasants, satisfied these groups. They committed various acts of violence, and even threatened to kill the Shah himself if he did not carry out their anti-Western policy. In 1951, the Madjlis (Parliament) voted to nationalize the British-owned oil industry of Iran. The main complaint was that Iran's share in the profits was too small. The British were unable to arrange a compromise. All the property of the Anglo-Iranian Oil Company was taken over by the Iranian Government. British technicians and employees were ordered to leave the country. Iranians were not capable of operating the industry themselves. Thousands of Iranian workers lost their jobs, and the country suffered tremendous financial losses.

R.Pea.

Related Subjects. The reader is also referred to:

Biography and History

Aryan
Cambyses II
Cyrus the Great
Cyrus the Younger
Darius
Firdausi
Greece (The Period of Glory)
Hafiz
Marathon
Media
Omar Khayyám
Riza Shah Pahlavi
Saadi
Xerxes
Zoroaster

Unclassified

Caspian Sea
Chess (History)
Dress (Dress of Ancient Times [Persia]; color plate, Costumes of Ancient Peoples)
Elburz, or Elbruz Mountains
Flag (color plate, Flags of Asia)
Khan
Kurdistan
Moslem
Persian Gulf
Petroleum
Rugs and Carpets
Tehran

Questions

Why is Iran connected with the tales of the Arabian Nights?

What is the meaning of the name *Iran?*

What were some of the developments of early civilization in Iran?

Why does Iran have no important rivers?

Where in Iran is the only place that trees grow?

Why are few crops raised in Iran even though the soil is good?

What resource of Iran is greatly desired by other countries?

In what part of Iran do the nomads live?

How did styles in clothing change during the 1920's in Iran? What caused the change?

What is meant by each of these: (a) *mullah*, (b) *bazaar*, (c) *arrack?*

How does an Iranian boy learn a craft? How are crafts being encouraged today?

What are Iran's chief exports? Chief imports?

Why has it been difficult to develop transportation in Iran?

How long may it take to make a Persian rug?

Why have recent rulers encouraged games in Iran?

What part did Iran play in World War II?

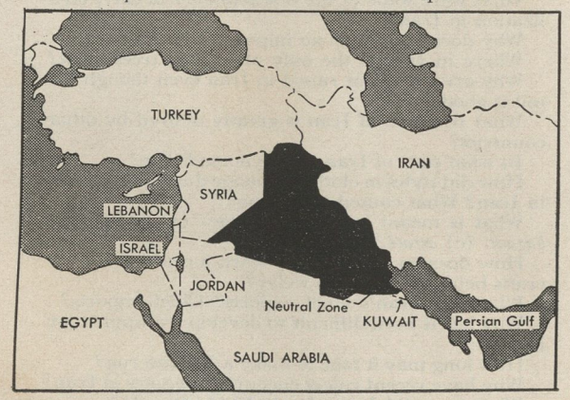
Errell, Pix

Bedouin Girl of Iraq. The beads at her neck are a charm intended to shield her from dangers and evil.

IRAQ, *e RAHK*, is a kingdom in southwestern Asia. It is a new nation in the old country that was called Mesopotamia. Iraq was formed from three provinces of the Turkish Empire (Mosul, Baghdad, and Basrah), at the end of World War I. This land was the home of the world's oldest known civilization. The people of Mesopotamia lived in villages, used pottery and bronze tools, and grew food crops at a time when Europeans were still savage hunters, wandering through the forests in search of wild game and berries and roots.

The early Mesopotamians invented important tools such as the wheel and the building arch. They were the first to divide the day into twenty-four hours. They used elaborate irrigation systems to water their fields. The region which became Iraq was far more prosperous in ancient times than it is today.

But Iraq still has valuable resources. It produces four fifths of the world's dates and is an important source of oil. Iraq's oil makes the country important to Great Britain, the United States, and the Soviet Union. Iraq is one of the important strongholds of the Moslem world. It has begun to develop itself as a modern nation and to identify its interests with those of its Arab neighbors.



Location Map of Iraq

Mesopotamia means *land between two rivers*. The richest, oldest, and most important part of Iraq lies in the valley formed by the Tigris and Euphrates rivers. The name *Iraq* means *department* in Arabic, for the three Iraq provinces once made up a department of the Turkish Empire.

The Land and Its Resources

Location, Size, and Surface Features. Iraq lies at the head of the Persian Gulf and forms the northeastern part of the Arabian peninsula. See ARABIA (colored map).

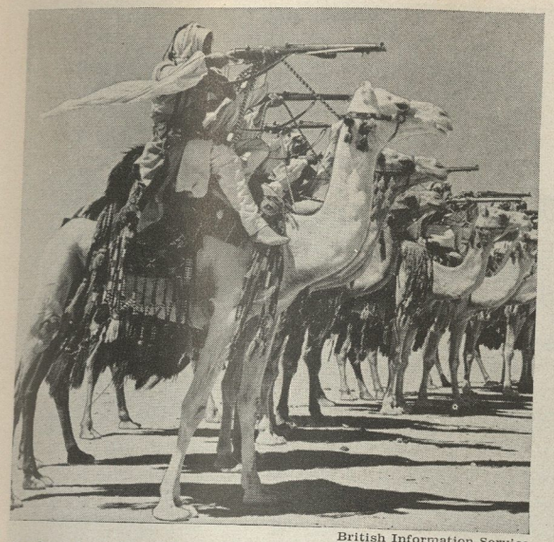
Iraq has an area of 168,243 square miles. It is a little larger than the state of California. Most of the country is flat, but the Zagros Mountains in the northeast part of the country rise to heights of over 12,000 feet above sea level.

There are four natural regions. *Lower Mesopotamia* is the southeastern part of the valley formed by the Euphrates and Tigris rivers. This region slopes from northwest to southeast and is only slightly above sea level. *Upper Mesopotamia* (formerly Assyria) is the part of the river valley which extends from Baghdad to the Syrian border. Upper Mesopotamia is a rolling, grassy plain. Northeast of the Tigris-Euphrates valley lies *Kurdistan* (the land of the Kurds), a wild, mountainous region. Kurdistan is part of the Iranian Plateau which stretches across northern Iraq. The *Arabian Desert* extends into Iraq in the western part of the country. Iraq is about one-twentieth desert, one-twentieth bush-forest, and nine-tenths dry plains, or steppes.

Sawders

Men of Iraq crossing the Euphrates River on ox-hides blown up with air. Rivers in Iraq were often crossed in this way before there were many boats or bridges.

Rivers. The Tigris and Euphrates rivers rise in the mountains of Turkey and flow from northwest to southeast through Iraq. (See EUPHRATES; TIGRIS RIVER.) They meet above Basra, and from that point to the Persian Gulf the stream is called the Shatt-al-Arab. The rivers are the life blood of the country. They give water for crops and make the soil rich. Both the ancient ruins and the modern cities of Iraq were built along the river banks. But in flood-time the rivers destroy crops, ruin houses,



British Information Service

Arabs of an Iraqi Camel Corps. They ride barefooted, and practice long hours to gain skill in firing from the saddle.

and leave swamps which are only wasteland. The Tigris is about 1,150 miles long. River steamboats sail up the Tigris as far as Baghdad. The Euphrates is a slow, winding river, 1,700 miles long. Only small river craft travel on the Euphrates because it is shallow.

Climate. Iraq is very hot in summer and quite cold in winter. The rainy season comes during the winter months, but little rain falls.

Natural Resources. The chief wealth of Iraq is its oil. Small deposits of other minerals include salt and poor-grade coal. The three chief oil fields are near the Persian border, in the northern Tigris Valley, and near the Euphrates River.

The discovery of oil in the 1920's was of great importance to Iraq. A foreign company controlled by Great Britain leased the oil rights. Pipe lines were built to carry the oil down to the sea. A railroad which had been planned before World War I was completed in 1940 because it was needed for transporting oil. Iraq now ranks seventh among the oil-producing countries of the world. There are four British-American oil companies operating in Iraq. The Iraqi government has a separate budget for spending the money it gets from the oil companies to develop the country's resources.

Iraq's second most important resource is its fine and dusty soil. The Tigris and Euphrates rivers have changed their courses many times and have deposited fertile soil throughout the valley. There is good grazing land in the mountain region and in the rolling north country. Iraq has almost no trees except in the mountain country of Kurdistan and along the rivers.

Irrigation of one sort or another is absolutely necessary to the life of Iraq. Some important irrigation projects have been built in modern Iraq. These include the Hindiya Barrage, or dam, which lifts the level of the Euphrates River and forces the water onto the plain, and the Habbaniya Escape, which releases the waters of the Euphrates so that they will not flood the farm lands. The Kut Barrage on the Tigris provides irrigation for some 900,000 acres of land through a canal called the Gharraf. Other irrigation projects have been planned by the government. In 1950, Iraq received $10,800,000 from the International Monetary Bank to build a flood-control dam on the Tigris at Tharthar.

The People and Their Work

The People. Iraq has an estimated population of 4,800,000. The people are called Iraqis. There are about 41 persons for every square mile of land. About fifteen of every hundred persons live in cities. Most of the people are Arabs, but about 500,000 Kurds, 100,000 Turks, and 100,000 Persians live near the borders of the country.

The Kurds are tribal herdsmen who live in the valleys of Kurdistan and move from one pasture land to another. The Arabian desert is also inhabited by wandering herdsmen. Races have mingled in the river valleys and cities. But the tribesmen of the borderlands keep to themselves. Arabic is the official language of Iraq. Kurdish is the semi-official language for those provinces where the majority are Kurds.

Way of Life. Most Iraqis live the same sort of primitive life their ancestors lived in ancient times. Herdsmen live in tents and travel on camels. They wear long white robes which reflect heat and absorb moisture. Villages and cities are largely made up of whitewashed mud houses. In the large cities life is more modern but still

Oriental Institute, University of Chicago

An Iraqi Workman with a Pickax, engaged in digging operations with an American archaeological expedition. The expedition uncovered a great aqueduct built long ago by the Assyrian king, Sennacherib. Iraq's many ruins show that the country was very important and powerful in ancient times.

Sawders

A Village of Iraq on the bank of the shallow Euphrates River. Many buildings of Iraq are made of dried mud covered with whitewash. The trees that spread between the buildings are date palms, which supply one of Iraq's chief crops.

very different from the life of European and American cities. Most of the land is owned by a small class of large estate holders. The common people are very poor.

Agriculture. Most Iraqis earn their living by farming. Wheat and barley are grown in the northern part of the river valley, rice on the river borders, and tobacco in the mountains. Dates are an important product and the date industry is directly under the control of the government. Sheep, cattle, water buffaloes, camels, and the famous Arabian horses are raised.

Primitive farming methods are used. Getting water to the fields is a large part of the farm work in Iraq. Small dams, called *wevis*, are built out into the rivers. These have crude water wheels at the ends. The river moves the wheels, bringing the water up in little cups attached to their sides. The cups spill the water into a runway, which carries it to the fields.

Trade and Industry. Iraq's chief imports are cotton goods, sugar, tea, clothes, iron and steel, and machines. The chief exports are dates, oil, grain, wool, animals, and hides. One third of the country's trade is carrying goods from other countries to Iran, which has few good ports. The production and refining of oil is the only important industry.

Transportation and Communication. The rivers are important highways for travel. Some river boats are round like bowls and made of reeds covered with pitch. The camel is the chief means of travel in the desert, and elsewhere the donkey is used. Most of the roads are caravan paths. Iraq has about 4,500 miles of roads, but only 1,400 miles with hard surfaces. Bus systems carry traffic over the roads. A railroad connects Iraq with the rest of the world and joins the three chief cities, Mosul, Baghdad, and Basra. Many air lines stop at these cities on their way from Europe to India and the Far East.

Education and Religion. The primary schools of Iraq are free, but only about 150,000 pupils attend them. There are special schools for Jewish and Kurdish children. Iraq has more than 150 secondary schools and about ten colleges. Most of the people are Moslems. There are also about 100,000 Christians and 90,000 Jews.

Cities. For a description of Baghdad, the capital of Iraq, see BAGHDAD.

Basra, *BUS rah* (population about 100,000), is the chief port of Iraq. It lies near the Shatt-al-Arab about 80 miles inland from the Persian Gulf. The old city is about two miles from the river, but the new suburb, Ashar, is the actual port. The river is only 26 feet deep at high tide, so many ships stop farther down the river. Modern Basra was founded by the Arabs in A.D. 638. It is famous in literature as *Bassorah*, the scene of many of the adventures of Sinbad the Sailor, a hero of the *Arabian Nights*.

Mosul, *moh SOOL* (population about 109,000), is the most important city in northern Iraq. It lies on the right bank of the Tigris River. The ruins of the ancient city of Nineveh lie a mile away across the river. Mosul is an old trading city, where the grains, fruits, and sheep of the region are bought and sold. It was an ancient center for native craftsmen. "Mosul bronze" pieces and muslin, a fine cotton textile, were named for the city. The most impressive building is the Great Mosque, formerly a Christian church.

Mosul declined in modern times. But it became important again after oil was discovered in the near-by hills. A railroad built in 1940 linked Mosul with Baghdad and Basra in the south and Turkey and Europe in the north.

Government

Iraq is a limited monarchy, according to a law passed by the Constituent Assembly in 1924. The government of Iraq is somewhat like that of Great Britain. The king

selects a Prime Minister, who names a cabinet, which must be approved by the legislature. The Cabinet can be removed by the legislature. The legislature, or Parliament, has two houses. The senate is made up of no more than twenty-nine "old and wise men" who are appointed by the king, and the lower house has 138 elected members. Since 1944, the king has had the power to dismiss his government. Iraq is really ruled by the king with the help of a small group of aristocrats. There are civil courts; and religious courts for matters of inheritance, marriage, and divorce.

History

The earliest civilizations in Mesopotamia flourished for a time and then decayed. They included Babylonia, Assyria, and Chaldea. After the ancient civilizations of Mesopotamia declined, the country was conquered by the Arabs. Later it became part of the Ottoman Empire of the Turks. It was still in Turkish hands when British forces invaded the Near East during World War I.

After the war, the people revolted against foreign rule, and the British were forced to give the country its own government. The Iraqis elected King Feisal I to the throne in 1921. Great Britain kept control over Iraq through a mandate from the League of Nations. Feisal I proved a good ruler. He helped the Iraqis in their attempts to gain independence. In 1930 Great Britain signed a treaty recognizing the independence of Iraq. The country became a member of the League of Nations in 1932. King Feisal was followed by his son Ghazi in 1933. At Ghazi's death in 1939, King Feisal II became ruler. A regent ruled for him during his childhood.

Iraq remained friendly to Great Britain, and during World War II continued to sell its oil to the United Nations. German agents tried to start a revolution against the British, but the British drove them out. Iraq declared war on Germany, Italy, and Japan on July 17, 1943, and became one of the United Nations.

Sawders

Native of Baghdad, Iraq, spinning cotton yarn. As the man walks, the threads reel off the spindles onto the frame.

In 1948, Premier Saleh Jabr of Iraq signed a twenty-year treaty with Great Britain. This treaty provided British protection and military aid for Iraq. It also guaranteed the British the use of the two airfields which they had built at Habbaniya and near Basra. Rioting Iraqis protested this treaty, and the regent rejected it.

Iraq joined with other Arab League countries in 1948 to fight the Jews in Palestine. The oil pipeline to Haifa, Palestine, was closed, and Iraq fell into financial difficulties because of the loss of oil revenue.

By 1949, the Communist underground organization was gaining strength in Iraq. The Communist party had been outlawed since 1938, but secret agents worked among various classes and racial groups in Iraq, playing upon their dislike for the British and for each other. R.PEA.

See also ASSYRIA; BABYLONIA; FLAG (color plate, Flags of Asia); KURDISTAN; MESOPOTAMIA; TURKEY (History).

Questions

Why is it said that the Tigris and Euphrates are the life blood of Iraq?
Where are the chief oil fields of Iraq?
Why is irrigation needed in Iraq?
Who owns most of the land in Iraq?
What city of Iraq was the scene of many adventures of Sinbad the Sailor?

IREDELL, JAMES. See NORTH CAROLINA (Famous North Carolinians).

IRELAND. See EIRE; NORTHERN IRELAND.

IRELAND, JOHN (1838-1918), was the Roman Catholic Archbishop of St. Paul, Minn., from 1888 until his death. He was born in Ireland, and educated in France. His family moved to the United States when he was a child. Ireland was ordained in 1861. He was an ardent patriot and served as a chaplain in the War between the States. Ireland became coadjutor bishop in 1875, succeeded to the see of St. Paul in 1884, and was made an archbishop in 1888. He was a fiery preacher for American ideals and for the rights of the working class. Among his building projects were the Cathedral of St. Paul and the St. Paul Seminary. He wrote the book, *The Church in Modern Society*, and many articles. F.J.S.

U&U

John Ireland, Archbishop of St. Paul, was called the "Consecrated Blizzard" for his energetic activity in church and civil affairs.

IRENE (752-803) was empress of the Byzantine or Eastern Roman Empire (A.D. 792-802). She took the throne from her son, Constantine VI, but the nobles of her court turned against her. She was exiled to Lesbos.

IRIDIUM, *ih RID ih um* (chemical symbol, Ir), is one of the rare precious metals of the platinum group. In its metallic state, iridium is lustrous silver-white in color, but it takes on all the colors of the rainbow when dissolved in hydrochloric acid. For this reason, iridium is named for Iris, the Greek goddess of the rainbow. Iridium is twenty-two times as heavy as water, and it is one of the hardest pure metals. Next to osmium it is the most

refractory metal known. Iridium is more expensive than platinum because of its scarcity and hardness. Iridium is usually found in gravel deposits, chiefly in Russia and California.

It is combined with platinum to make a very hard compound which is used in chemical utensils, electrical contact points, and standard weights and measures. Iridium is also used in making jewelry, fountain-pen points, surgical instruments, and is used in photography. Iridium is in group two of the chemical elements. The atomic weight of this metal is 193.1, and its atomic number is 77. H.A.Sc.

IRIGOYEN, *EE ree GO yayn,* **HIPÓLITO** (1850-1933). See ARGENTINA (History [Later Struggles for Power]).

IRIS. See EYE (Parts of the Eye).

IRIS, *EYE ris.* This popular plant has large beautifully colored flowers. The name *iris* comes from the Greek word for *rainbow.* Irises are also called *flags.* They grow in many places throughout the temperate regions.

Several things about the iris set it apart from other flowers and make it easy to recognize. The leaves rise directly from the bulb, or rootstock. They are usually narrow and erect. The unusual shape of the flowers sets them apart from other plants. They are made up of three sets of parts, which resemble petals. The outer set of three, called the falls, curves outward, while three other segments come together at the top like an arch; these are known as standards. The third set is made of three petal-like stigmas that cover the stamens.

J. Horace McFarland

A Handsome Variety of German Iris, the species grown most commonly in gardens of the northern United States. Iris breeders call the erect upper parts of the flower the "standards," and the drooping parts the "falls." The inner part of the falls has a mat of soft fuzz, called the "beard."

The colors range from white and yellow to mauve and purple. They appear in many beautiful combinations, suggesting the colors of the rainbow.

Some species of iris have long been cultivated for their flowers. They show glorious yellows, bronzes, and reds. Irises come in many different sizes, from dwarf plants to others four and one-half feet tall. The *blue flag* is a common wild species that grows in swamps in the United States.

Irises bloom in spring and summer, from about March through July. They may be planted in the spring before blooming, or afterwards, in autumn. The plants are perennials, but give the best flowers if they are replanted about every four years. The roots tend to crowd each other, and must be respaced, or divided into new plants. Bearded varieties do best in sunny ground that is not too rich. The beardless kind can grow in damp rich soil.

Diseases of the iris include soft rot, crown rot, and leaf spot. If the disease is serious, roots and ground may have to be treated with germicides. The worst insect enemy is the iris borer. Its larvae eat their way through the leaves and roots, and almost always bring on soft rot. After the plants have bloomed, all roots should be examined for borers. They should be dug out with a knife.

The Florentine iris is the source of *orris root,* which is used in perfumes and medicine. Iris growing has become an important specialty. An active American Iris Society promotes this work in the United States. The iris is the state flower of Tennessee.

Fleur-de-Lis used in a conventionalized design

Fleur-de-lis is a name sometimes used for the iris. It is French for *flower of the lily.* Fleur-de-lis is also the name of a design that is supposed to represent the white iris. This design became the emblem of the kings of France in the 1100's. Charles V finally adopted three golden fleur-de-lis on a blue field as the coat of arms of the French kings. A.C.Ho.

See also FLOWER (color plate, Common Garden Flowers); FREESIA; ORRISROOT; POLLEN AND POLLINATION (color plate).

Classification. Irises belong to the iris family, *Iridaceae.* The species include the yellow iris, *Iris pseudacorus;* Spanish iris, *I. xiphium;* English iris, *I. xiphiodes;* dwarf bearded iris, *I. pumila;* blue flag, *I. versicolor;* and *I. barbata,* a hybrid species, which includes the bearded iris.

IRIS was the golden-winged goddess of the rainbow in Greek mythology. She was the messenger of the gods, especially of Hera who was queen of the heavens. Iris swiftly carried the commands of the gods to men on earth. The path she traveled was the rainbow.

In art, Iris is shown seated behind the chariot of Hera. She wears an airy garment of mother-of-pearl color. P.Col.

IRISH FREE STATE. See EIRE.

IRISH HOME RULE BILL. See ASQUITH, HERBERT HENRY.

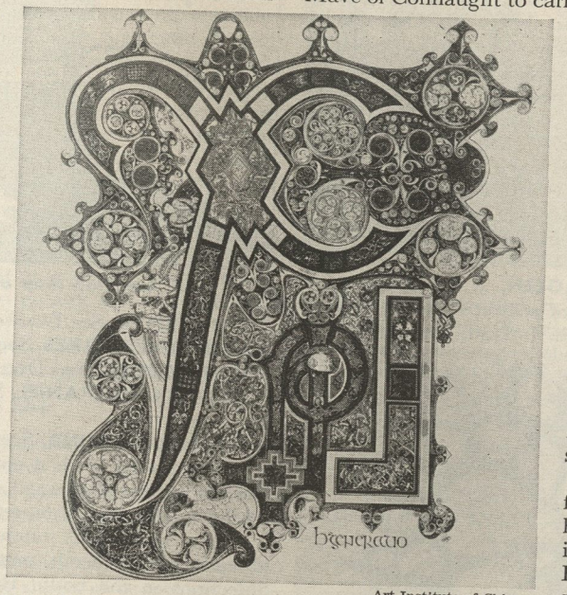
IRISH LACE. See LACE.

IRISH LAND LEAGUE. See DAVITT, MICHAEL.

IRISH LITERATURE. The term Irish literature properly refers only to literary productions in the Irish, or Gaelic, language. But many distinguished Irish authors have written in English.

The people of Ireland had no written literature before the coming of Christianity, as far as we know. But they had a crude alphabet, called *ogam,* suitable only for inscriptions. They also possessed many traditions which later appeared in literary form. Christian missionaries came to Ireland before and during the time of Saint Patrick, who arrived in A.D. 432. They brought with them the art of writing, which they had learned from the Roman clerks who copied books in ancient France, or Gaul. The Irish adopted the Roman handwriting when they accepted Christianity. They improved upon the writing, and used it to set down their traditions.

The Golden Age. No written Irish literature earlier than the 600's has been preserved. But a large body of legends of saints, lyric poetry, and folk stories, or *sagas,* remains. These were composed from about A.D. 700 to 1000, but most of the surviving manuscripts date from a later period. This early period has been called the Golden Age of Irish literature.



Art Institute of Chicago

The Irish "Book of Kells" is famed for its beautiful decorations. This intricate design of the letter P covers a whole page. The book was written and drawn by hand sometime during A.D. 700. It contains the four gospels from the Bible.

The early Irish produced many legends about saints. Among these are several notable lives of Saint Patrick, which tell something of the work of the great apostle to the Irish. Christianity flourished so abundantly during the Golden Age that medieval Ireland has been called the Island of Saints and Scholars. Irish missionaries led by Saint Columba brought Christian culture to the north of Britain. Other Irish missionaries helped to re-establish Christianity on the continent of Europe after the barbarian invasions.

Early Irish manuscripts contain a large number of lyric poems, many of which are real gems of poetic art. Numerous early Irish lyrics were composed by hermits. These poems often deal with the natural surroundings of the authors. They show a freshness of appreciation and a true love of nature found nowhere else in the literature of the Middle Ages.

The largest body of early Irish literature consists of sagas, romances, and heroic tales. These are composed in prose mingled with verse. They fall into three groups, or cycles.

The Mythological Cycle. This group deals with the loves, battles, and other deeds of the Tuatha Dé Danann, and other peoples. They are supposed to have settled in Ireland before the beginnings of history. Chief among the characters were the *sidhe,* or *she,* who still appear as the fairies of modern Irish folklore. Some of the characters in this cycle may have been ancient gods.

The Ulster or Red-Branch Cycle. The tales of this group relate the deeds of the heroes of ancient Ulster. They center around the court of King Conchobar, who is said to have ruled Ulster about the time of Christ. The chief hero is the boy champion, Cu Chulainn. The ancient Irish storytellers never tired of relating his marvelous deeds. The longest of the Ulster epics is the *Cattle-Raid of Cooley.* It tells of the efforts of Queen Mave of Connaught to carry off from Ulster the famous brown bull of Cooley. Cu Chulainn defends the frontier against her whole army without any help.

The Finn or Ossianic Cycle. This group includes sagas, romantic tales, and many ballads about the deeds of the famous chief, Finn MacCool and his son Oissin, or Ossian. Finn MacCool is supposed to have lived during the third century. His son is better known through the pretended translations (really original compositions) published by James Macpherson about 1760.

The ancient Irish were fond of music, and Irish harp players were popular in the courts of western Europe. The copyists, or scribes, developed to a high degree of perfection the art of writing books and of decorating manuscripts. One of the earliest manuscripts decorated in the Irish style is the *Book of Kells.* Many people consider it the most beautiful book in the world.

Scandinavian invaders destroyed many manuscripts containing Irish literature after they began to arrive late in the 700's. After the Normans came, Irish literature gradually declined in quality. Literature in the Irish language never flourished under English rule. The poets, or bards, who composed in that tongue grew ever fewer. The professional storytellers, or *shanachies,* still went through the country singing their ballads and relating ancient traditions. But native Irish literature since the Middle Ages shows few traces of genius and holds little of interest except for scholars.

Works in English

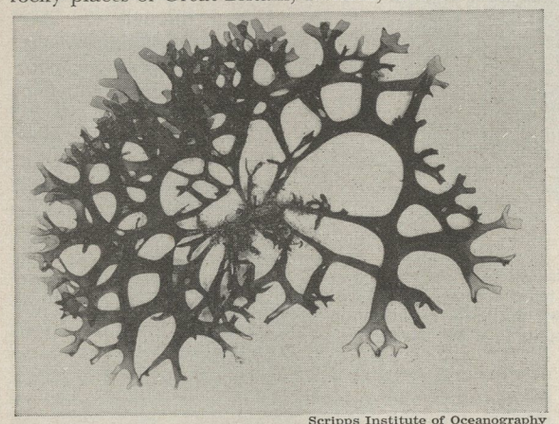
A few Irish authors began to write in English during the reign of Queen Elizabeth. An increasing number of Irishmen have continued to write in English since then. Among them have been writers of distinction, including Oliver Goldsmith, Maria Edgeworth, and Richard Brinsley Sheridan. But their works contain

little to identify these writers as Irishmen. The poetry of Thomas Moore helped to create an interest in Irish traditions, but it has little of the spirit of real Irish poetry.

A group of young Irish literary men attempted to create an Irish literature in the English language late in the 1800's. Among them were William Butler Yeats and George Russell, who used the letters AE as his pen name. The efforts of this group brought about what is known as the Irish Literary Revival. The drama profited especially by this movement. The famous Abbey Theatre Players in Dublin began performing plays on Irish themes early in the 1900's. Other well-known dramatists who have written in English recently are Lady Gregory and John Millington Synge, who wrote about the fisherfolk of the Aran Islands. Famous Irish writers of verse or prose in English include Oscar Wilde, George Bernard Shaw, Padraic Colum, James Stephens, and Sean O'Casey. But their works actually belong to English literature instead of Irish. T.P.C.

See also DRAMA (The Irish Revival); GREGORY, AUGUSTA, LADY; MOORE, THOMAS; SYNGE, JOHN M.; YEATS, WILLIAM B.

IRISH MOSS, or **CARRAGEEN,** *KAIR ah GEEN*, is the name of several kinds of seaweed which grow in rocky places of Great Britain, Ireland, and the eastern



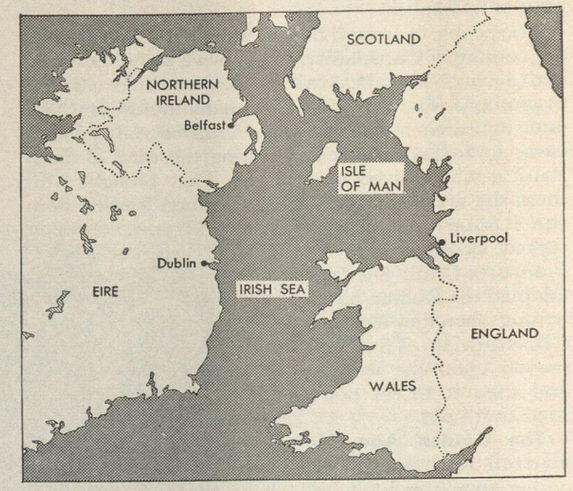
Scripps Institute of Oceanography

Irish Moss Is a Valuable Seaweed that is used for food and in making certain medicines for lung diseases.

coast of North America. The most common Irish moss has thick, forked fronds which are shaped like a fan. It is reddish-brown or purple in color. It is sold commercially after it has been washed, bleached, and dried in the sun. Irish moss is not very nutritious but is very much sought after as the basis of soups and desserts. Irish moss is also used by painters as the foundation of size, or a protective coat. See also SEAWEED. L.H.T.

Classification. Commercial Irish moss, *Chondrus crispis*, belongs to the family *Gigartinaceae*.

IRISH SEA. This small sea separates Ireland from England and Scotland. The Irish Sea opens into the Atlantic Ocean through Saint George's Channel on the south and through the North Channel on the north. The Irish Sea is about 130 miles long, and is 140 miles wide at its widest point. The eastern half of the sea is shallow, but the northwestern part reaches a depth of about 850 feet. The Isle of Man lies in the north-central section of the Irish Sea. The island of Anglesey lies off Wales. See also MAN, ISLE OF. H.U.S.



Location Map of the Irish Sea

IRISH SETTER. See DOG (color plate, Sporting Dogs).

IRISH SWEEPSTAKES. See EIRE (Recreation).

IRISH TERRIER. See DOG (color plate, Terriers).

IRISH WATER SPANIEL. See DOG (color plate, Sporting Dogs).

IRISH WOLFHOUND. See DOG (color plate, Hounds).

IRITIS, *eye RI tis*, is a condition in which the iris of the eye becomes inflamed. There is redness, tenderness of the eyeball, and intense pain. The eye is very sensitive to light. Iritis often results from rheumatism; diseased tonsils, teeth, or nasal sinuses; or many other infections in the body. It is a serious condition and should be treated by a competent eye specialist. P.R.C.

IRKUTSK, *er KOOTSK*. See SIBERIA.

IRON AGE. The use of metal had a great deal to do with the way prehistoric people lived. Very early peoples made tools and weapons from chipped or polished stone. Later they used copper and brass. Somehow they discovered that iron was harder than brass, that it would take a sharper edge, and that it was much easier to work. Iron made so much difference in man's way of life that we use the name *Iron Age* for the period in which early peoples learned to use it.

The first iron implements seem to have been beaten or hammered into shape. Such implements are said to be made of *wrought* iron. Many of them were skillfully made and beautifully decorated. A few had symbols and markings on them, indicating the beginning of writing.

Southern Europe learned the use of iron long before the northern countries. The Iron Age had begun in Greece and the Aegean Islands during the period portrayed by Homer in his *Iliad* and *Odyssey*. But the people of the Norse lands knew little of iron before the time of Julius Caesar, about fifty years before Christ. A.V.K.

See also BRONZE AGE; DRESS (Dress of Prehistoric Times); IRON AND STEEL; STONE AGE.

IRON AND STEEL. If all the iron in the world were to disappear today, the result would be worse from an engineering standpoint than if a huge atomic bomb exploded. The atomic bomb would leave some parts of buildings standing. But should iron disappear, our tall buildings would topple to the earth. Our wooden houses would fall apart for lack of nails. Our cars and trains would be only little piles of wood and rubber. Railroad and streetcar tracks (made of steel, a form of iron) would vanish. We would not even have stoves on which to cook our food.

Industry depends on this valuable metal more than on any other element of nature. Nearly all machines and tools in factories and on farms are made of some form of iron. Iron also makes possible many of our means of communication, including the telephone, telegraph, and radio. Iron is even necessary to our bodies, as it supplies the hemoglobin which gives the red color to our blood, and keeps us healthy. In plants, iron is the life-giving chlorophyll that makes leaves green.

The United States produces more than $1,000,000,000 worth of pig iron in an average year. The value of this product is greater than that of any other single manufactured product. It is also greater than the value of all other metals combined.

The value of all steel products, most of which are made from pig iron, is nearly $3,000,000,000 a year.

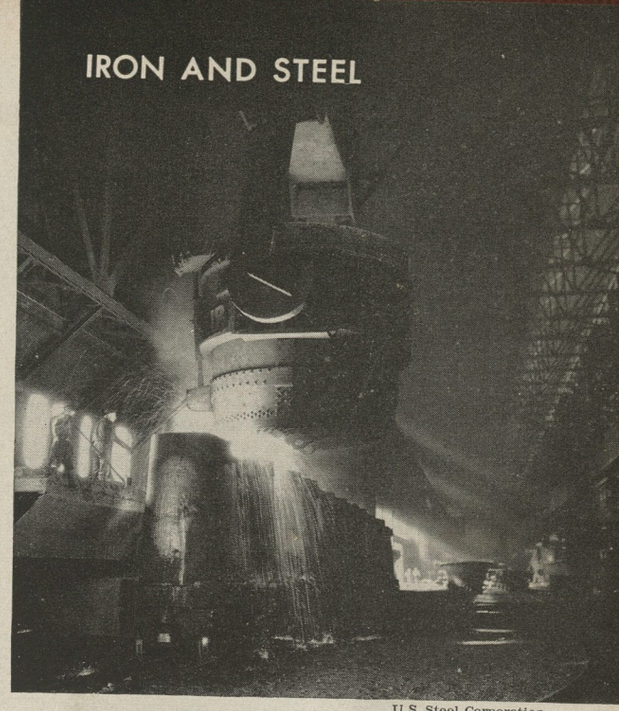
Iron Ore

This metal which is so important to our daily lives is found in both earth and rock. It is seldom found in a pure state. But when it is, there are certain physical qualities, or *properties*, which identify iron beyond question.

Properties. Pure iron looks very much like silver. It can be hammered into thin sheets or drawn out into very fine wires. Iron unites easily with nonmetals, such as sulfur, oxygen, and carbon. The tendency of iron to unite with oxygen is the reason that we so often see rusty iron. Iron and oxygen form a chemical compound called *iron oxide*, which is actually rust. Iron may be combined, or *alloyed*, with many other metals. An alloy of $\frac{1}{4}$ to $2\frac{1}{2}$ per cent carbon in iron makes steel. (See OXIDATION; RUST.)

Chemists have a system of symbols for each metallic element. The symbol for iron is *Fe*, which is the first two letters of the Latin word *ferrum*, meaning *iron*. There is also a table of chemical elements which numbers and groups elements according to their physical properties and weight. Iron (Fe) is placed in Group IV of this table. Iron has an atomic number of 26, and an atomic weight of 55.84. The metal has a specific gravity of 7.8, which means that a piece of iron weighs 7.8 times as much as an equal amount of water. Scientists have also set up a scale of hardness by which they can classify the hardness of all minerals. In this scale, iron falls into Group V. This means that the metal can be cut with a knife, but only with great difficulty.

Iron will dissolve in water, although the process takes a long time. The iron of the earth is constantly being carried by rainfall and flood water from one place to another.



U.S. Steel Corporation

How Iron Is Formed. Scientists believe that iron was formed at the time the earth was created. Iron makes up about 5 per cent of the earth's crust and is found all over the world. The purest iron is found in the metallic bodies called meteorites which sometimes fall to the earth out of the sky. The iron ore in the earth contains many impurities. These impurities are other chemical elements such as sulfur, carbon, phosphorus, lime, magnesia, arsenic, silica, copper, and titanium.

Kinds of Iron Ore. There are many different kinds of iron ores. They include limonite, goethite, hematite, magnetite, siderite, pyrite, marcasite, and pyrrhotite.

Hematite, sometimes called *specular* iron because of its metallic shine, is the source of 90 per cent of the iron produced in the United States. This ore contains 70 per cent iron and can be easily identified by its dark red to black color. Hematite leaves a cherry red to dark red mark, called a *streak*, when it is scratched across harder materials. Scientists use this streak test to identify many minerals, but especially to identify the different iron ores. Hematite is found in masses or in long, pointed shapes, called *crystals*. It is harder than most iron ores, and has a table of hardness rating of 6. This means that it can be scratched, but not cut, with a knife. The chemical symbol of hematite is Fe_2O_3. This means that it contains much oxygen as well as iron. The oxygen is the cause for its rusty color. The ore weighs less than an equal amount of pure iron. A piece of hematite weighs only 5.2 times as much as an equal amount of water.

Limonite is the source of only about 1 per cent of the iron produced in the United States. But it is an important source of iron in Sweden and Scotland. Limonite contains about 60 per cent iron and is yellow-brown to black in color. It streaks a yellow-brown. Limonite is found all over the world. It is not so hard as hematite, having a table of hardness rating of 5. The chemical symbol of limonite is $2Fe_2O_3 \cdot 3H_2O$. This means that limonite contains much water in addition to iron oxide.

It is lighter than hematite, weighing only 3.8 times as much as an equal amount of water.

Magnetite, or magnetic iron ore, is the source of about 3 per cent of the iron in the United States. In Norway, Sweden, and some other European countries magnetite is the chief source of iron. The ore contains 72.5 per cent iron. It can be easily identified because it is *magnetic*, or attracts other metals. Magnetite is black, and makes a black streak. It is found in large masses or in lumps called *crystals*. Magnetite is as hard as hematite, with a table of hardness rating of 6. The ore weighs 5.8 times as much as an equal amount of water. Its chemical symbol is Fe_3O_4.

Siderite is sometimes called *spathic iron* because it can be separated into thin plates. It is scarcely ever used in the United States as a source for iron. But it is widely used in Germany and England. It contains only about 49 per cent iron and is identified by its gray-brown color. Siderite makes a white streak. The ore is found both in stringy masses and in rounded crystals. It has a hardness rating of only 3.5, so it is quite soft. It can be cut with a knife. Chemists give siderite a symbol of $FeCO_3$. The ore weighs 3.8 times as much as an equal amount of water.

Pyrite, *goethite*, *marcasite*, and *pyrrhotite* are all poor sources of iron. Pyrrhotite and goethite are rare and pyrite and marcasite each contain so many impurities as to be of little use in making metal.

Sources of Iron. Iron is present in some degree almost every place on earth, but it is mined only in those sections of the world where it is of the purest quality and where it can be reached easily. The thickness of the deposits of iron also is considered when mining it. Probably the purest iron of the world, except for meteoric iron, is found at Disco Island, Greenland. This pure iron is taken in large chunks from a *basaltic rock*, which has been formed by gases and liquids thrown off by volcanoes deep beneath the surface of the earth. These gases and liquids rise to the surface through cracks, or *faults*, in the earth's crust. When they cool, they form a hard mass called *igneous* rock. An *igneous* rock is *basaltic* when it breaks away into smaller boulders. The basaltic rock at Disco Island breaks away into boulders of almost pure, or *native* iron. Some of these iron rocks weigh as much as twenty tons. See BASALT; IGNEOUS ROCK.

Hematite is the principal iron-producing ore of the United States. It is mined on the northern and western banks of Lake Superior in the Mesabi iron range of eastern Minnesota. Here the ore is so loose that it can be scooped up with power shovels. For many years the Mesabi Range produced three of every four tons of iron ore mined in the United States. Another great source of hematite ore is the famous Clinton Range. This vein of iron ore starts as a foot-thick layer in New York and extends south through the Appalachian Mountains to Alabama, where the vein reaches a thickness of more than ten feet.

Limonite is found in nearly all countries. It is sometimes found at the bottom of ponds, where it may be as deep as six inches. These deposits are called *bog iron*. It is also found forming a nonsulfurous cap over veins of sulfide minerals. In such cases it is called *gossan*, a word from the Cornish language meaning *iron hat*.

Much magnetite is found in the Scandinavian countries, in the Adirondack Mountains region, and in New Jersey, Pennsylvania, Arkansas, North Carolina, New Mexico, and California.

Siderite occurs throughout the Appalachian Mountains, and also in Massachusetts, Connecticut, New York, and Ohio.

How Iron Is Mined. The methods of mining iron depend on the type of ore deposit and its depth in the earth. A bog-iron deposit is mined by methods similar to the *placer mining* of gold. Huge shovels dip the iron sediment from the bottom of the pond. Straining equipment is then used to separate the iron from the other minerals in the ore. Power shovels are used to mine iron ore which is near the top of the ground, as in the great Mesabi Range of Minnesota. Such mining is called *open-pit* mining. The shovels scoop up large amounts of the ore and place it on boats and trains to be taken to the mills. Iron which lies near the surface but is buried in rock is loosened from the rock by means of dynamite placed in holes bored into the rock by drills. This is called the *opencut* method. Iron which lies beneath the ground is mined much the same as other underground metals. Tunnels are dug along the vein of iron, and tunnel openings, called *adits*, are provided so that men may enter the tunnels.

How Iron Is Made

Some of the impurities which iron ore contains tend to weaken the iron for practical uses. Oxygen, which causes rust, actually eats away the metal. Sulfur and phosphorus cause iron to be very brittle and to break easily. Therefore, it is necessary to remove these impurities before the iron can be used.

The Blast Furnace. One of the most common methods of purifying iron is the blast furnace. This furnace is the center of an elaborate system which includes every step in the production of pig iron. If the furnace stops, the whole system must close down. For this reason, iron manufacturers refer not only to the furnace itself but also to all the various equipment connected with it as *the blast furnace*.

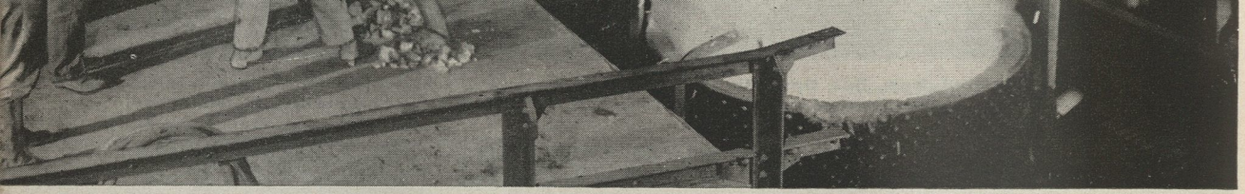
In order to understand better the workings of a blast furnace, let us follow the iron ore from the moment it enters the yards. Large cranes unload the ore from the boats or trains and dump it into piles. Quantities of limestone are dumped on other piles in the yards. Another large crane, called an *ore bridge*, picks up these materials and places them in storage bins close to the blast furnace. There are separate bins for the iron ore, for the limestone, and for the coke which is used to fire the blast furnace. The furnace is loaded with a mixture, called a *charge*, of certain amounts of coke, limestone, and ore. The charge is then loaded onto a *scale car*, which weighs the materials so that a load of exactly the right size is made up. The charge is now deposited into a *skip car*, which travels up a sloping track to a position over the blast furnace. The blast furnace itself is a tall, chimneylike structure which may be a hundred feet high. It is made of firebrick held together by bands of steel. At the very top of the furnace is a small bin, or *hopper*. The skip car dumps the charge into this hopper.

Caterpillar Tractor Co.

Iron Ore Is Scooped from This Open-Pit Mine near Hibbing, Minn., and loaded into railroad cars. Then it is hauled to the shore of Lake Superior and transferred to boats, which carry the ore to Great Lakes smelting centers.

U.S. Steel Corporation

The Temperature of a Roaring Open-Hearth furnace is taken with a special thermometer called a pyrometer. The great heat would melt any ordinary instrument, but this one measures it exactly by both chemical and electrical means.

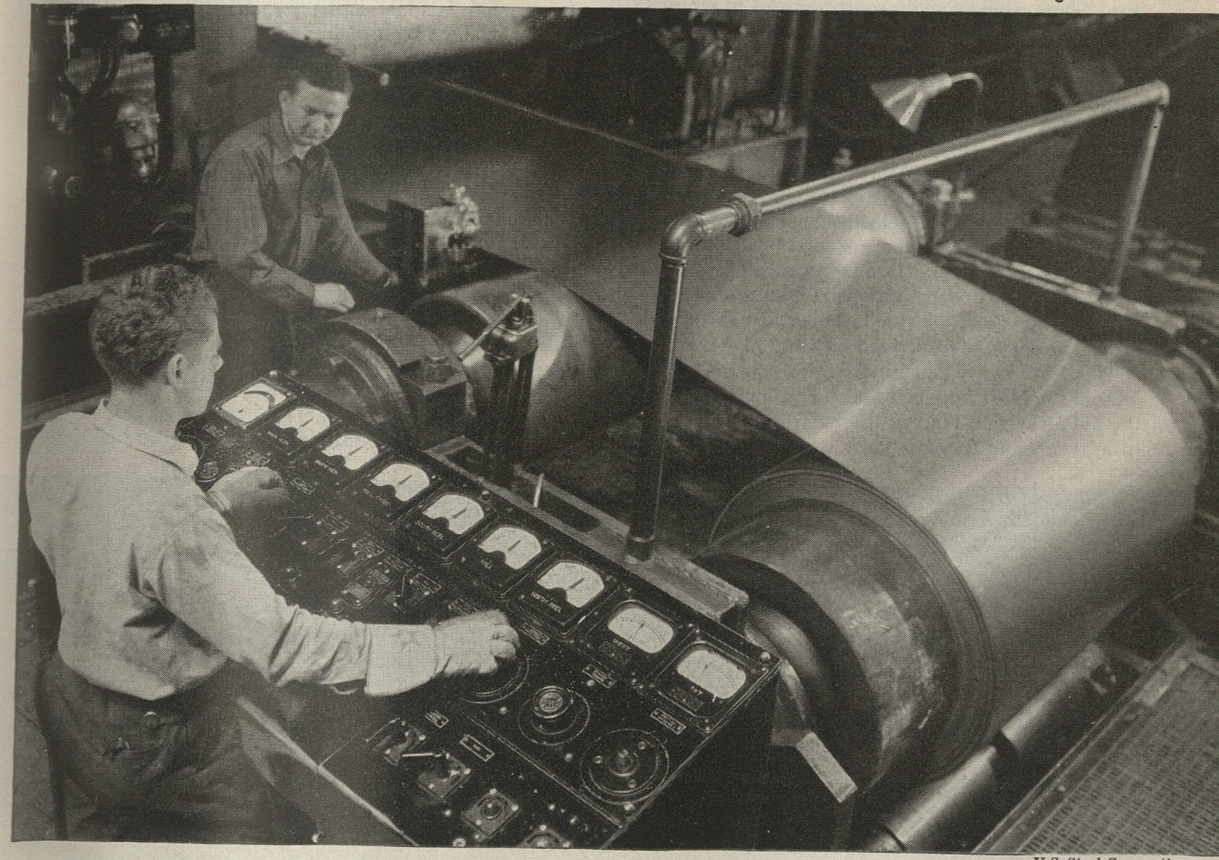


Molten Steel Is Poured from an Electric Furnace by tilting it. The liquid metal spills into a ladle carried by a traveling crane. The electric furnace is very efficient in making fine-quality steel, because its heat is easy to control.

U.S. Steel Corporation

Showers of Sparks Fly from the Grinding Wheels as workmen smooth a slab of stainless steel. The grinding takes off scaly particles and small cracks that may have been left on the slab by the big rollers in the rolling mill.

A White-hot Block of Steel, Called an Ingot, is lifted from a heating pit by a huge crane. The ingot is the form into which all iron and steel is poured as it comes from the furnaces. This ingot will be shaped into slabs in the rolling mill.

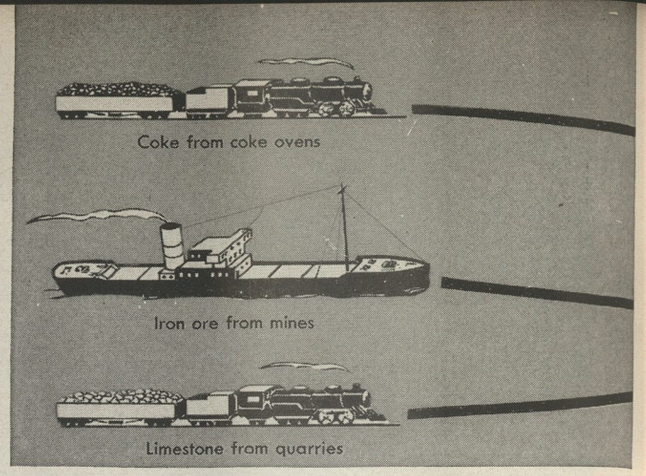


U.S. Steel Corporation

A Coil of Sheet Steel for Making Automobiles is pressed to correct thickness by the powerful rollers of this machine. As it comes from the rollers, it is being measured by the instruments on the dial board before it is wound onto the coil.

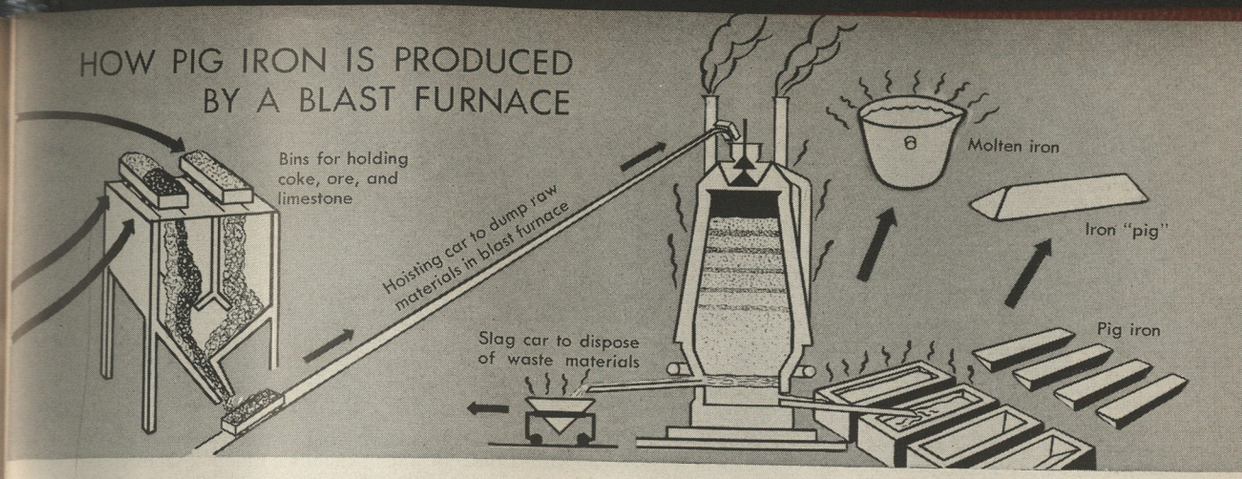
The hopper bottom, called the *bell*, opens downward, allowing the charge to fall into a much larger hopper. After six loads have been transferred from the small hopper to the larger one, the bell of the larger hopper also opens downward and the charge falls into the shaft of the furnace. This *double-bell hopper* system keeps gases from escaping from the furnace when it is loaded. The bells are timed so that only one may open at a time. As the charge passes slowly down through the furnace, it is struck by hot blasts of air about eight feet above the base of the furnace. This air enters the furnace through about a dozen holes, or nozzles, called *tuyères*, which are placed around the furnace. The hot air causes the coke in the charge to burn and give off carbon monoxide gas. The tiny particles called *molecules*, which make up the gas, hold one atom of carbon and one atom of oxygen each. But the tendency of carbon is to combine with *two* atoms of oxygen. So when the gas comes in contact with the iron each molecule of carbon monoxide picks up an atom of oxygen. This robs the iron of oxygen and removes one of its main impurities. Now the terrific heat of the furnace (usually from 2800° F. to 3000° F.) begins to melt the iron ore. The melted iron trickles down to the lowest portion of the furnace, called the *crucible*, or *hearth*. Many of the impurities which iron contains do not melt at temperatures as low as the melting point of iron. These would remain solid particles in the melted iron if the limestone had not been added to the charge. But the limestone causes the impurities to melt and run together, or *flux*. Pure iron has a much heavier weight than many of these impurities do, so the iron goes to the bottom of the melted mass. The impurities float on top of the iron in what is called a *slag*, or *cinder*. The slag is drawn off through a hole just above the hearth, at the *cinder notch*. The melted iron is drawn off from the furnace at a point almost level with the floor of the furnace, called the *iron notch*. The operation of the blast furnace is timed so that melted iron is drawn off several times during the day, and the charge is loaded often enough to keep the shaft of the furnace always full. Blast furnaces are usually operated day and night.

There are many machines which must be grouped around the blast furnace to keep it going. For instance, the hot air which is blown through the tuyères is heated in four or more *hot-blast stoves* which stand beside the furnace. These stoves heat the air to about 1200° F. Then the air is forced through a pipe to the tuyères under a pressure of about sixteen pounds per square inch. Each hot-blast stove operates separately. One stove is heated and used to blow air into the furnace for about one hour, then it is shut off from the furnace while the air in it reheats. During this time, another hot-blast stove is used to heat the air for the blast furnace. When coke burns with the hot air in the blast furnace, it produces a gas which has about one fifth the fuel value of city gas. This gas is taken out of the furnace by two pipes, called *gas uptakes*, at either side at the top. The uptakes lead into a large pipe which carries the gas into a tank called the *dust catcher*. The dust catcher strains much of the solid matter from the gas, then pipes it into a machine called the *gas washer*, which thoroughly cleans it. The gas is then burned under boilers which create steam pressure. This pressure operates the blowers which force the hot air from the hot-blast stoves into the tuyères of the blast furnace. The gas is also sometimes burned to reheat the hot-blast stoves.



Pig Iron is the product of the blast furnace. When the melted iron is removed through the iron notch, it is run into molds. The molds are then moved on a chain through cold water, and the iron hardens into bars called *pigs*. After the bars are cool, they are ready for shipment.

Pig iron is not pure iron. The slagging-off process does not always remove all the slag from the molten metal. Some of the impurities never become slag anyway, but remain in the molten iron. Thus, pig iron is only about 95 per cent iron. It usually contains from 3 to 4 per cent carbon and smaller amounts of manganese, phosphorus, sulfur, and silicon.



Pig iron might be called the raw material of the steel industry. Most of our steel and other forms of commercial iron are made from it.

Cast Iron is made by remelting pig iron and pouring it into specially shaped molds or *casts*. Cast iron is soft and rather brittle. The melting furnace which is used to melt pig iron for casting is a coke-burning furnace called a *cupola*. This furnace will remove a great deal of sulfur from the pig iron, but it does not remove phosphorus. The phosphorus in cast iron accounts for the brittleness of this metal. The carbon and silicon left in cast iron cause the metal to be soft.

Wrought Iron is another product of pig iron. The pig iron is placed on the hearth of a *puddling furnace*. Certain amounts of raw iron ore are also placed in the furnace. Under heat, the silicon and manganese of the pig iron form oxides with the oxygen in the iron ore. This leaves the iron in the ore free to combine with the molten pool of pig iron. The silicon and manganese oxides form a slag. This slag absorbs the phosphorus in the pig iron. Now workmen stir the slag and iron together in a process called *puddling*. Puddling causes the carbon in the molten iron to mix with the oxygen of the slag, and form carbon monoxide gas. The result is almost pure iron. This molten iron is converted into white, pasty balls filled with liquid slag. The balls are squeezed until the slag is removed. Then they are rolled into bars. A piece of wrought iron can be welded to another piece without solder. This operation is impossible with any other metal, except steel and platinum.

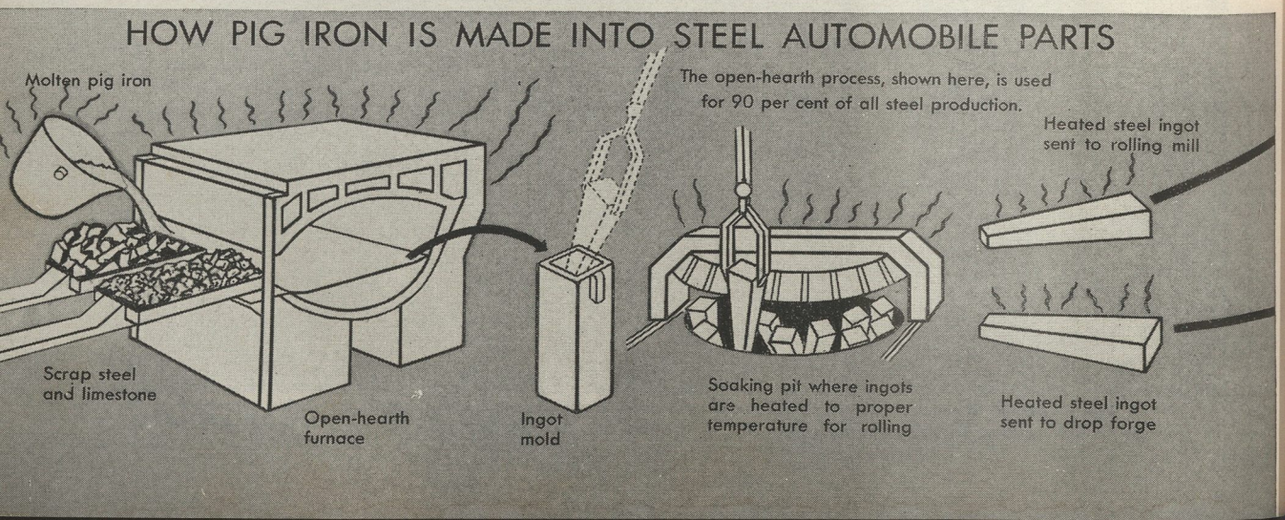
Uses of Iron

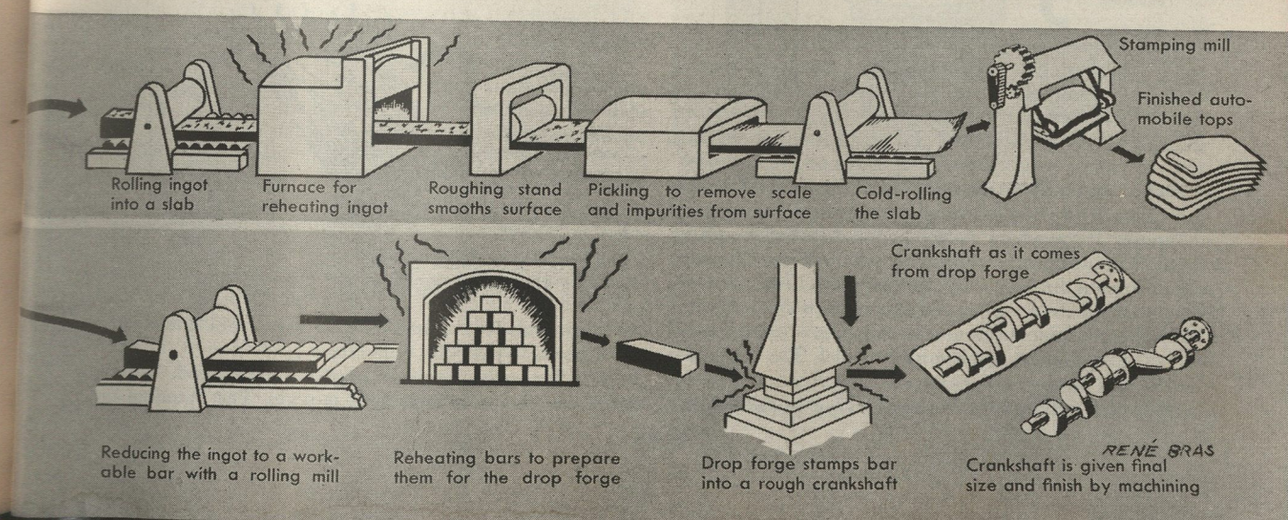
Iron is used for many things. Cast iron is used mostly for ornament. We see it in the brackets on school desks and on some heating stoves. Wrought iron is so easily worked that it can be used almost anywhere. It is used principally for bars, bolts, and plates. Pig iron in its raw state is not put to many commercial uses. Rather, it is used to make cast iron, wrought iron, and most important of all, steel.

How Steel Is Made

Makers of steel define it as a mixture, or alloy, of iron with $\frac{1}{4}$ to $2\frac{1}{2}$ per cent carbon. (See ALLOY.) Since iron from the blast furnace contains as much as 4 per cent carbon, the object of all steelmaking processes is to reduce the carbon to the desired percentage. This is done by heating the iron with other materials which will remove the carbon from the iron. After these materials have taken up the carbon, they are drawn off from the heating furnace as slag or as gas.

Blister Steel is made by placing bars of wrought iron in the puddling furnace and reheating them. The bars are covered with wood charcoal, and the heat of the furnace is brought up gradually. The iron soaks in the wood charcoal for a period of from seven to twelve days at high temperature. This causes the carbon in the iron to combine with the charcoal. Unfortunately, some of the carbon also combines with oxygen to form carbon monoxide gas. The gas forms bubbles in the steel which look like *blisters*. Blister steel is not considered a fine grade of steel, because the carbon which is left in the iron is not in even amounts throughout the steel. Thus,

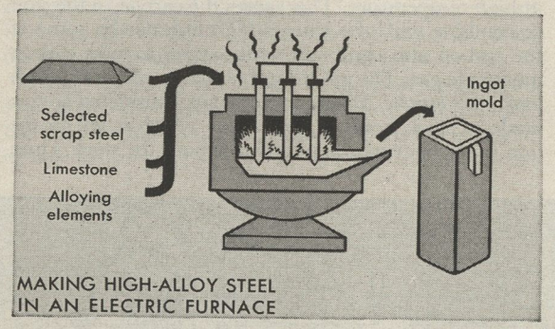




all parts of blister steel do not have the same strength and hardness.

Crucible Steel is made from blister steel or from pig iron. The crucible furnace consists of a melting pot, called the *hole*, and two pairs of *checker chambers*. These chambers are made of firebrick with air spaces in between, so that they look somewhat like a checkerboard. One pair of checker chambers is placed on either side and below the hole. Smaller melting pots, called crucibles, are lowered into the hole. These crucibles are made of 50 per cent clay and 50 per cent graphite, which is a carbon compound. The crucibles are the containers in which the steel is made. A mixture, or *charge*, of iron and other materials which absorb carbon is placed in the crucibles. Gas is heated in one of the checker chambers on one side. At the same time, air is heated in the other checker chamber on the same side. The gas and air unite in a flame over the pair of chambers. This flame passes through the melting pot around the crucibles and down through the checker chambers on the other side. At regular periods, the flow of air through the pairs of checker chambers is reversed. The heat is applied to the crucibles for about three hours. When enough carbon has been absorbed by the materials in the charge, the heat is shut off and the steel remains in the crucibles for about half an hour. This period is called *killing*. It is intended to allow any gases which may be present in the metal to escape. Later the crucibles are lifted from the hole by a man who is wrapped in wet bandages as protection against the intense heat. The steel is poured into molds to cool. After the molds are removed, the bars of steel, called *ingots*, are ready for rolling and forging.

Electric-Furnace Steel. The *Heroult* Furnace is the most popular of electrical furnaces. It is round, and the outside, or *shell*, of the furnace is made entirely of heavy iron plating. The inside is lined throughout with three layers of brick. The layer next to the shell is firebrick,

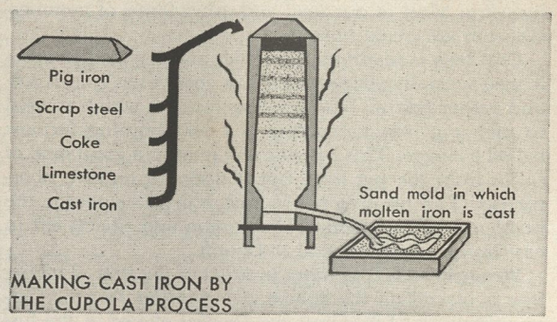


MAKING HIGH-ALLOY STEEL IN AN ELECTRIC FURNACE

and the two inside layers are magnesite brick. The bottom is built of double-burned magnesite. This type of magnesite throws back heat waves instead of absorbing them. The furnace is placed on two rockers. The men operating the furnace can tip the whole furnace when they wish to draw off or *tap* the molten steel. Electrically-charged pieces of carbon, called *electrodes*, extend from the roof of the furnace to the steel. The high heat is obtained because the path of electricity, or *electric arc*, is from one electrode to the next. That is, the current goes down through one electrode, travels through the steel to the next electrode, and then travels up the electrode. The electric furnace process is the best of all steel processes from the standpoint of control of quality. The operator can exercise full control over the make-up of the steel simply by changing the chemical composition of the charge.

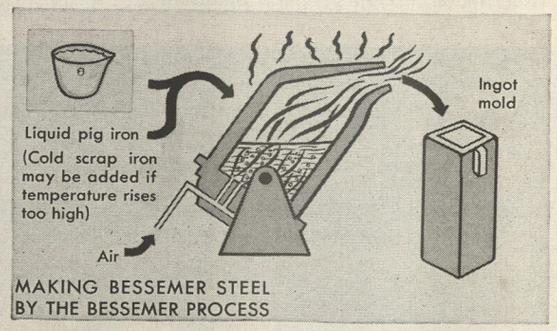
The electric furnace is rapidly replacing the crucible process in most steel mills, because it permits larger amounts of good steel to be made at a lower cost. See Electric Arc; Electrode.

Bessemer Steel. A Bessemer department is similar to a blast furnace in that it includes much equipment besides the furnace. The Bessemer department consists of a round melting pot, called a *Bessemer converter*, which actually makes the steel, a giant mixer where the charge



MAKING CAST IRON BY THE CUPOLA PROCESS

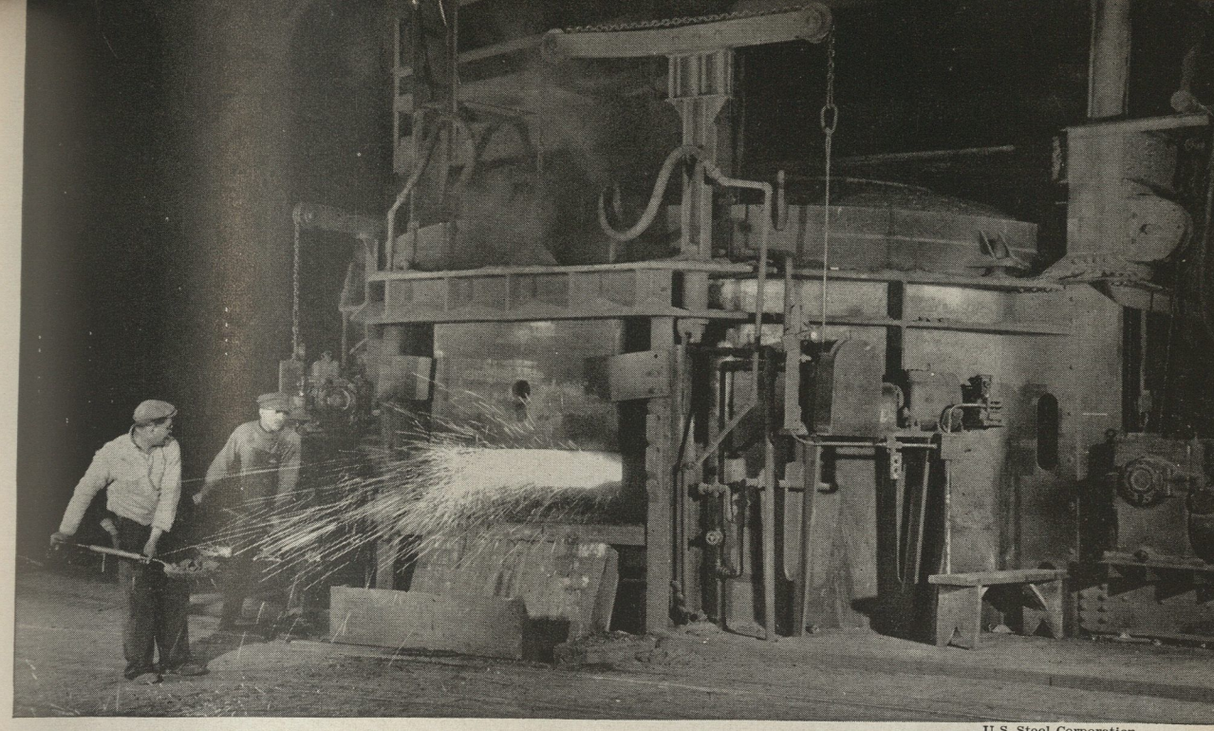
is prepared, and ladles which carry melted steel from the converters to a pouring platform where it is molded. Some Bessemer departments also have small blast furnaces, called *cupolas*, for remelting the pig iron before it is placed in the charge. However, most Bessemer departments are connected with the blast furnace, so that molten pig iron comes directly from the furnace to the mixer. Usually, the pig iron is brought to the Bessemer department in cars. As it enters the Bessemer department, the iron is lifted by cranes and placed in a 600-ton oval-shaped mixer. Other metals may also be placed in the mixer. At the proper time, the mixer is tipped. Hot metal pours from a spout at the top into the charging ladle. This ladle holds from ten to twenty-five tons



MAKING BESSEMER STEEL BY THE BESSEMER PROCESS

of hot metal. It is picked up by a huge crane and swung to a position over the converter.

The Bessemer converter itself is tube shaped. It may be about twice as long as it is wide. The opening, or


U.S. Steel Corporation

The Door of an Electric Furnace Is Raised as steelworkers stand ready to shovel alloy materials into the fiery opening. Various ingredients are added to make different kinds of steel, just as in preparing different kinds of foods.

nose, of the converter is placed at the top and slightly off center. The bottom of the converter is pierced by nozzles, called tuyères. Beneath the tuyères is a round steel plate box called the *wind box*. Compressed air is forced into this box and flows up through the tuyères into the steel. The converter is set on two supports so that it can be turned in a complete circle. It is lined with a glass-like material called *mica schist*, which contains a great deal of silicon.

When it is time for the metal to be poured into it, the converter is swung around to a position parallel to the ground, or horizontal. An iron trough, or *runner*, is swung into the nose. The iron from the ladle car is then poured along the runner into the converter. Then the runner is removed. The converter is now raised to an almost straight up and down, or vertical, position, and air is allowed to blow into the molten metal for ten to fifteen minutes under pressure of about twenty pounds per square inch. This period is called the *blow*. The oxygen in the air burns the pig iron which it first strikes. This flame passes swiftly through the churning mass of metal and comes out at the nose of the converter.

At this stage of operation, the silicon and manganese in the metal unite with oxygen to form silicon dioxide and manganese oxide. Neither silicon nor manganese oxides will dissolve in metal, so they form a slag. When silicon, manganese, or iron combine with oxygen, they form a great heat which raises the temperature of the remaining metal even higher. This causes the flame coming from the nose of the converter to be red. Now the carbon in the mixture begins to burn, setting up a roaring boil in the liquid metal. Now, about one and one-half tons of cold scrap iron are added to the mixture to keep it from getting too hot. The carbon burns briefly with a bright yellow flame. Then it begins to die down. This is the signal for the operators to turn the converter on its side and stop the blasts of air through the tuyères.

The steel within the converter is now practically free of silicon, manganese, and carbon, but it contains many harmful gases. So molten pure pig iron, containing 20 per cent manganese is mixed in. This iron is called spiegel iron. The manganese soaks up all the oxygen of the gases, and in about twenty minutes, the steel is quite pure, except for about 4 per cent manganese which it has absorbed. This small percentage of manganese is considered desirable because it toughens the metal, so the steel is ready to be poured into molds. It is poured from the converter into a ladle, which swings around and pours the molten steel into molds. When the steel is cool, it is taken to machines, called *strippers*, which remove the molds.

In the United States, the Bessemer process works on the principle that the silicon in the wall of the converter will combine with oxygen. This oxide is considered acid. So the process is called an acid process. An acid process will not remove sulfur or phosphorus, however. Therefore, iron ore which contains a high percentage of these elements cannot be converted by this method.

In Germany, where iron has a high sulfur and phosphorus content, a *Thomas converter* is used. The Thomas converter has a lining of lime or magnesite. The lime reacts with the sulfur and phosphorus to form a slag, while the magnesite reacts to rid the iron ore of carbon, manganese and silicon.

Open-Hearth Steel is made in extremely large rectangular furnaces with hearths which may hold from fifteen to 350 tons of molten steel. Two checker chambers stand on either side and underneath one end of the furnace. The furnace itself is built of silica brick held together by large steel columns and stays. A large pan made of riveted steel plate forms the bottom of the furnace, and a thick covering of magnesite brick is built over the steel

plate. Over this is another covering of double-burned magnesite. On one side of the furnace are doors where the charge is loaded in. This is called the *charging side*, or *floor side*. On the opposite side of the furnace is the *pit*, or *tapping*, *side*. This is where the molten steel is removed. To charge an open-hearth furnace, molten pig iron, limestone, and steel scrap are brought in on the floor side in charging boxes mounted on cars called *buggies*. A large crane then picks up each charging box, turns it, and dumps the contents into the furnace. Charges of limestone are placed in the furnace first. Pig iron is loaded second, and scrap iron is placed on top. If the pig iron is very hot, however, the limestone is loaded first, and the scrap second. The charge is then melted down before the hot pig iron is loaded into the furnace. After loading the furnace, the charge is gradually brought to a molten condition. The heat is supplied by gas and air which come from the checker chambers. The fuel and air meet at the end of the furnace and burst into flame which passes into the furnace through ports placed above the charge. Gases pass out at the other end through uptake pipes and are brought back to the checker chambers. This operation is very similar to the operation of the checker chambers in a crucible furnace.

After the charge is melted, the lime at the bottom begins to work up through the steel to form a calcium-silicate slag on the top. At the same time, it removes a portion of the sulfur and almost all the phosphorus in the charge. The high heat is continued until the furnace operator, called the *melter*, decides the steel is ready for tapping. As in the Bessemer process, spiegel iron is added to take away harmful gases and to add manganese content to the steel. Then the ladle is placed under the spout of the taphole and the taphole is opened. The ladle is equipped with a small spout. The slag which runs out through the taphole along with the steel skims off through this spout into a large container, which is called a *thimble*, because of its shape. The ladle is picked up by a huge ladle crane which can carry a load of about 200 tons. The steel is then poured into molds.

Acid Open-Hearth Process. The furnace for this process is constructed like the furnace for making basic open-hearth steel. The only difference is that the furnace bottom is built of silica brick and silica sand which has been *fired*, or *sintered*. That is, the silica sand has been heated to a point where it fuses together slightly, but does not melt entirely. Acid open-hearth furnaces are usually smaller than other open-hearth furnaces. They are used mostly in foundries where steel castings are made. The furnace is charged in the same way as a basic open-hearth furnace except that the limestone is left out. The pig iron is placed on the bottom and scrap is charged on top. The best scrap iron and pig iron must be used in this process, since the acid process will not remove sulfur and phosphorus. The acid open-hearth process removes about the same impurities as the Bessemer process does—manganese, carbon, and silicon.

Soaking Pit. Steel mills have soaking pits which keep ingots hot from the time they are taken from their molds until they are ready to be rolled. The pit is square in shape, made of brick, and kept warm by checker chambers similiar to those of an open-hearth furnace. On top of the pit there is an arched cover which rolls aside as the ingots are loaded into it. The average soaking pit contains from two to six ingots standing on end. After the liquid ingots have become solid in their molds, the molds are removed by the stripper, and the ingots are dropped into the pit. At this stage of the process, the steel on the outside of the ingots is red hot, while the steel inside the ingots is white hot. The pit is kept at a temperature high enough to bring the entire ingot up to white-hot heat.

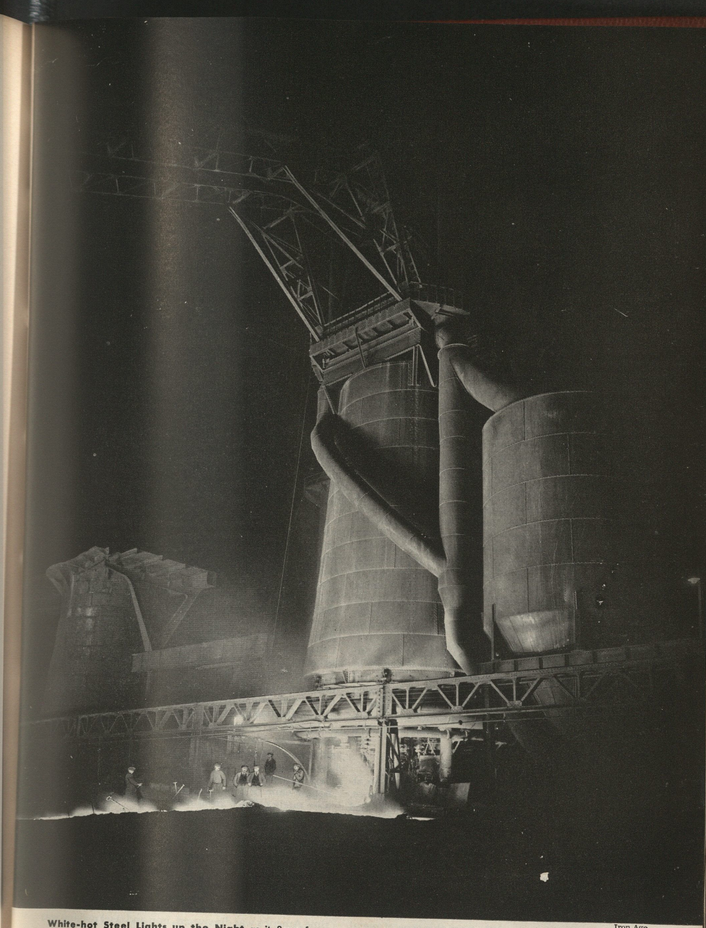
Rolling Mills. The ingots which come from the soaking pits are not in usable form. They are generally thick squares or oblongs of molten metal which must be pressed into uniformity and shaped before they can be used. Rolling mills take care of this need. Every steel rolling mill contains a succession of rollers. The first of the rollers is generally very heavy and powerful. Each roller is grooved in the shape of the desired article. The rollers are so arranged that each time the steel is passed through another roller, it becomes smaller and closer to the required final shape. Some of the rollers, called *blooming mills*, which do the very heavy first work on steel, have screw-down attachments. This means that the roller can be lowered so that it presses the article smaller each time it is passed through. Many different kinds of steel rolling mills are used, depending on the article which is to be made. Many of them have equipment for stamping and hammering as well as for rolling. Among the different kinds of rolling mills are plate mills, and rail mills.

Rail Mills. Ingots which are to be shaped into railroad rails are heated white hot and rolled in blooming mills until the rail is about four inches high by two inches across. Most of the steel ingots have hollow places, or *pipes*, in the top because liquid steel becomes smaller, or *contracts*, as it hardens. Since the sides of the ingot become cooler first, they usually harden in the shape of the mold. Then the white-hot steel inside the mold begins to cool and pull away from the top of the mold, leaving a hollow space, or *pipe*, at the top of the mold.

To make sure that the rail contains no hollow spaces which would weaken it, *guillotine shears* are used to trim the ends away. These shears are operated by hydraulic power and are called *guillotine* because they look somewhat like the beheading machines which are used for executing criminals in France. The shears also cut the rails into lengths called *billets* which will make one to two rails of standard length.

The billets are reheated and run through rollers which are grooved so that the top and bottom sections of the rail fall into the grooves and are not rolled out so thin as the center of the rail. The rails are passed through these rollers fifteen times before they are finished. The final operation in making rails is the punching of holes in the bottom, or *flange*, of the rails so that they may be spiked down. Many structural steel shapes are made in the same way as railroad rails. Among these are I beams, channels, and angles. Extra-heavy equipment is required to make H beams, but the process is the same as in making rails.

Carburization. This process consists of adding carbon to the outer edge of steel shapes to form a hard shell around the softer steel. It is also called *casehardening*. The carbon is added by bringing the steel object in con-



Iron Age

White-hot Steel Lights up the Night as it flows from a towering blast furnace. The furnace has just been opened, or tapped. The liquid metal flows through open ditches called runners and into ladle buckets that will be moved by cranes.

tact with a solid, liquid, or gas which contains carbon. Then it is heated to a temperature about 1600° F. to 1800° F.

Pack carburizing is the oldest way of adding carbon to steel. It consists of placing the steel in a sealed container, along with a form of pure, or *free*, carbon, to which a metal and carbon compound has been added. The whole mass is heated, causing the metal and carbon compound, called a *metallic carbonate*, to break up into different chemical compounds. One of these is *carbon dioxide gas*. The tiny molecules which make up this gas each contain one atom of carbon and two atoms of oxygen. When the carbon dioxide touches the free carbon in the pack, the two oxygen atoms in the gas molecules split. One leaves the carbon dioxide molecule to combine with an atom of free carbon and make molecules of *carbon monoxide gas*. Such molecules contain one atom of oxygen and one atom of carbon. The heat has caused the outer edge of the steel object to expand slightly. This means that the molecules in the object have drawn a little apart from each other, leaving spaces for the carbon monoxide gas to creep in. This process is called *diffusion*. The carbon in the gas combines with the steel, and the oxygen passes off as gas, leaving the case harder than the steel inside.

Liquid carburizing is used to make steel where a thin case is desired. For cases thicker than one three-hundredths of an inch, other methods are used. The liquid which is used to carburize the iron is usually a carbon and oxygen compound, called a *carburizing salt*, which has been melted, or *fused*. The carburizing salt usually is a compound of cyanogen and calcium or sodium and oxygen. Chemists call such a compound cyanide. When the steel is dropped into the fused cyanide and the temperature is raised, the cyanogen begins to break up. Cyanogen molecules are made up of two atoms of oxygen combined with two atoms of carbon. They break up into new molecules containing one carbon and one oxygen atom each. This compound is carbon monoxide gas. It diffuses into the steel in the same way as it does in pack carburizing.

Gas carburizing is a method similar to the pack carburizing, except that gas instead of solids is placed in the sealed container with the steel. Gases used for this system of carburizing usually contain both hydrogen and carbon. Such gases are called *hydrocarbons*, and include methane, ethane, propane, and butane. The carbon atoms leave the gas and diffuse through the iron to form the case hardening.

Iron and Steel Alloys

Other elements must be mixed with the steel to attain different properties of strength, chemical resistance, or softness. Usually these elements are iron, combined with varying amounts of tungsten, vanadium, chromium, nickel, zirconium, titanium, molybdenum, uranium, columbium, copper, manganese, silicon, and lead. For instance, a mixture, or *alloy*, of iron with large amounts of nickel and chromium makes a steel which is very resistant to rust in the hot zones of furnaces. Such irons are cast, and they have greater strength and resistance to wear. The motor blocks of nearly all internal-combustion engines are made from this type of metal.

Steels alloyed with chromium and copper and containing a great deal of phosphorus weigh only about one third as much as old-type steels. These steels are much used in making lightweight streamlined trains. Lead is added to steels which are to be subjected to swift and repeated machining. Such steels are called *screwstocks*. The lead is not mixed with the steel, but exists as a separate metal in the steel. Stainless steels are another example of steel alloys which resist corrosion. They are made usually in an electric furnace, and contain chromium and nickel. The most widely known stainless steel contains 18 per cent chromium and 8 per cent nickel. Steelmakers call it 18-8 steel.

Uses of Steel

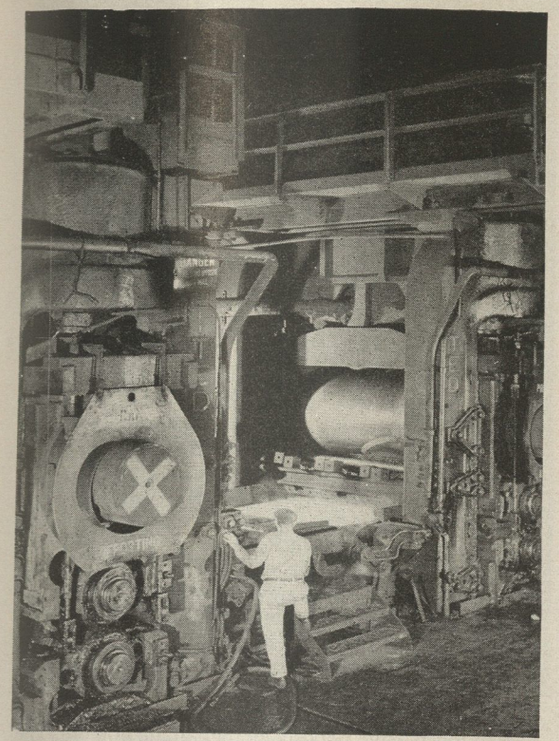
Steel is used everywhere that great strength or resistance to chemical reaction is needed. It is made into wire which in turn is spun into large cables. These cables hold up the long suspension bridges which are one of the marvels of our age. The metal is made into many different kinds of beams to support tall buildings. It is also made into other structural shapes such as channels and angles. Stainless steel in particular is used to make kettles, pans, knives, forks, and spoons, for use in the home. Other common uses of steel are in engines, as armor on warships, and to make the framework of railroad cars and automobiles. Steel has been worked into fibers fine enough that sheer hosiery could be woven from it.

History of Iron and Steel

We do not know when iron was first discovered. But a piece of iron in the British Museum is thought to have been made six thousand years ago by the Egyptians. The Assyrians were probably the first people to become skilled workers in the metal, however. They are generally credited with starting the Iron Age. The Assyrians had iron chariots and beautifully made ornaments for their harnesses. They had iron swords and tools, and their saws and files were much like the ones we use today. They also knew how to make steel. During the Crusades, the Assyrians became famous for their steel swords. Saladin, a Turkish ruler, had a steel sword sharp enough to cut through a feather pillow at one blow. Only six hundred years ago, iron pots and pans were considered extremely valuable. See ANCIENT CIVILIZATION (Materials); ASIA MINOR.

In early times iron was separated from its ore in a very simple way. It was put in a hot fire of charcoal, and the iron melted and trickled out to form a lump of metal. Ironmakers soon discovered that the hotter the blast, the better the metal. So they blew on the fire through a hollow cane or tube. Then different kinds of bellows were made to force air into the fire.

The Spanish ironworkers of Catalonia built a better kind of furnace. The air was forced in by huge bellows which operated by hand or by water power. This Catalan forge was used by ironworkers through the Middle Ages. The demand for iron and steel became so great that larger and larger furnaces were built. More powerful air currents were forced through the fire. Coal and coke were used instead of wood and charcoal. By the time America was discovered, iron and steel making was



U.S. Steel Corp.

Steel That Goes Down to the Sea in Ships is being reduced in width to 87 inches. This high-strength plate metal will be used to cover the sides of an ocean-going vessel.

already a thriving trade. English settlers set up the first ironworks in America at Falling Creek, Va., in 1619. It was operated by the Virginia Company and stayed in business until 1624 in spite of Indian attacks. The next ironworks of this country was established at Lynn, Mass., on the Saugus River in 1643. John Winthrop, Jr., operated the works with other men who called themselves the *Company of Undertakers for the Iron Works*.

In 1740 an Englishman, Benjamin Huntsman, discovered a way to make uniform steel from blister steel. His method opened the way to the crucible process of making fine steel.

The first iron rolling mill to puddle iron and roll iron bars was built by Isaac Meason in 1816 at Plumpsock, Pa. Later many more rolling mills sprang up. Then, in 1856, Sir Henry Bessemer, an Englishman, built the first Bessemer converter. This discovery, combined with the need for good steel for railroads, opened the Age of Steel.

Vocational Opportunities

There are many opportunities for young men—and even young women—in the iron and steel industries. There are jobs for *chemists* who conduct research in an effort to find new ways of alloying steels and irons to make stronger and better metals.

There are great opportunities as *engineers* to devise new methods for heating and making the steel, or for laying out the arrangement of the furnaces and rolling mills to achieve greater efficiency.

Engineers of a rolling mill in Pennsylvania figured out a system for laying out the mill so that only about five men were required to operate the entire gigantic plant. The industry offers many other jobs as crane operators, melters, furnace operators, roller operators, miners, and foundry workmen.

There are entire firms of iron and steel brokers, who buy iron and steel from the mills and sell it to manufacturers and builders. All the mills and brokers have *salesmen* who must be familiar with the qualities of different irons and steels in order to advise and sell to manufacturers and builders. H.McC.

Related Subjects. The reader is also referred to:
Ambridge, Pa.
Bessemer, Henry, Sir
Bethlehem Steel Corporation
Bridge
Carbon
Carnegie, Andrew
Casting
Colonial Life in America (Ironmaking)
Ductility
Foundry
Galvanized Iron
Gary, Ind.
Industrial Revolution (The Iron Industry)
Iron Age
Mesabi Range
Nails
Ore
Republic Steel Company
Smelting
Tempering
United States Steel Corporation

Outline

I. Introduction
II. Iron Ore
A. Properties
B. How Iron is Formed
C. Kinds of Iron Ore
D. Sources of Iron
E. How Iron Is Mined
III. How Iron Is Made
A. The Blast Furnace
B. Pig Iron
C. Cast Iron
D. Wrought Iron
IV. Uses of Iron
V. How Steel Is Made
A. Blister Steel
B. Crucible Steel
C. Electric-Furnace Steel
D. Bessemer Steel
E. Open-Hearth Steel
F. Acid Open-Hearth Process
G. Soaking Pit
H. Rolling Mills
I. Carburization
VI. Iron and Steel Alloys
VII. Uses of Steel
VIII. History of Iron and Steel
IX. Vocational Opportunities

Questions

How do scientists think iron was formed?

From where does the purest iron in the world come?

What is bog iron? How is it mined?

What is open-pit mining? Opencut mining?

What is meant by the *charge*? A *scale car*? A *skip car*?

What is slag? How is it removed from the blast furnace?

What is pig iron? For what is it chiefly used?

What is blister steel? Why is it not a high-quality steel?

Why is an electric furnace placed on rockers?

What people probably began the Iron Age of history?

When was the first ironworks established in America? The first rolling mill?

IRON CHANCELLOR. See BISMARCK-SCHÖNHAUSEN.

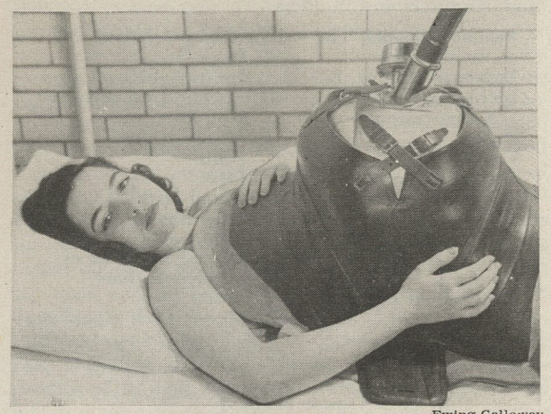
IRON CITY. See PITTSBURGH (Pa.).

IRON CROSS. See DECORATIONS AND MEDALS (Germany).

IRON CROWN OF LOMBARDY. See CROWN; ITALY (Government and History [Middle Ages]).

IRON GATE. See DANUBE RIVER.

IRON LUNG is a device which is used to treat paralysis of the muscles and organs of breathing. It is sometimes called a respirator. In cases of paralysis the chest loses its normal muscle action, and the person is in

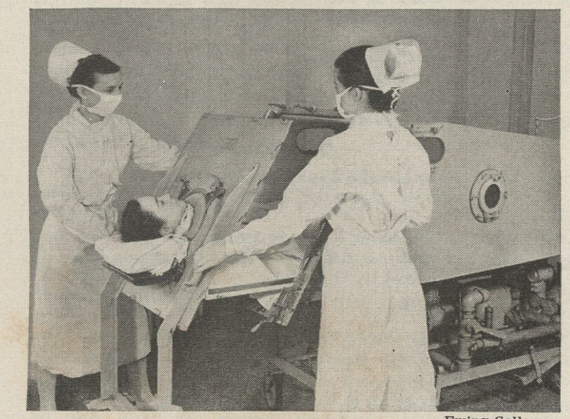


Ewing Galloway

A Portable Type of Iron Lung, or Respirator. The portable type is preferable to the tank type in suitable cases, since it is much more convenient and allows the patient more freedom.

danger of dying from slow suffocation, because he cannot get enough air into his lungs. The iron lung makes it possible for the patient to breathe normally.

The iron lung is a large metal tank with an attached pump that changes the amount and pressure of the air within the tank. The patient lies in the iron lung with only his head outside. A rubber collar at the neck keeps air from escaping. Fifteen to thirty times each minute the pump withdraws air from the tank, the patient's chest is raised, and air enters his nose and mouth just as



Ewing Galloway

Placing a Patient in an Iron Lung of the Tank Type. When closed, this type of iron lung becomes a sealed chamber in which the air pressure is regularly increased and reduced.

it would naturally. Then air is allowed to flow back into the tank, the chest is lowered, and the patient exhales. This process has been carried on for hours, and even for several years in certain cases. It has been successful in carrying many people who suffer from infantile paralysis over the severe period of the disease. Multiple respirators, in which four patients can be treated at the same time, have sometimes been used.

The iron lung was developed in 1928 by Philip Drinker and Louis A. Shaw at the Harvard School of Public Health in Boston. In 1937 Dr. Bo Sahlin developed an iron lung which has no tank. The Sahlin iron lung is a breastplate shaped like a dome. This device is attached to the chest and connected with a pump. W.W.B.

IRON MASK, MAN IN THE, was the name popularly given to a famous prisoner in the Bastille in Paris. The prisoner always wore a mask during the years he was held in the Bastille and other French prisons. His identity was a closely guarded secret. He is believed to have been Count Mattioli (1640-1703). Mattioli was an Italian statesman who served as secretary of state to Charles III and Charles IV, rulers of Spain and certain provinces in Italy. Mattioli is believed to have revealed the details of secret negotiations for the sale of the fortress of Mantua, Italy, to France, and was imprisoned in 1698 for his treachery. He died in prison. There are several other versions of the story of the man in the iron mask.

IRON MOUNTAIN. This hill in the Saint François (or St. Francis) Mountains of southeastern Missouri was named for its large deposits of high-grade iron ore. The mountain also contains porphyry, a hard purple-tinted stone which takes a high polish and is used for ornaments. Iron Mountain is 1,078 feet above sea level, but the peak lies in a high region and is only 300 feet above the surrounding country. The slopes of the mountain are covered with oak forests. The highest elevation in Missouri, 1,772 feet above sea level, is near by. L.D.,JR.

IRONSIDES is a name that was given to Oliver Cromwell's army. The soldiers were said to have shown iron courage at the Battle of Marston Moor in 1644.

IRONSIDES, OLD. See CONSTITUTION, THE.

IRONWOOD, or **HORNBEAM.** These names are given to certain trees that have exceptionally hard wood. In North America two well-known species belonging to the birch family are included in this group. One of these is the *hop hornbeam*, or *ironwood*, a small forest tree that grows throughout the United States east of the Rocky Mountains. The trees usually grow singly in the woods. The slender trunks grow from twenty-five to fifty feet tall, and have grayish, flaky bark. The leaves look like birch leaves, and the fruit clusters look like hops. The wood of the hop hornbeam is so hard that lumberjacks have used the trunks of the trees as levers. It is one of the best materials for tool handles and small implements. Pieces that are free from knots are good for making bows.

The other species is called *American hornbeam*, *blue beech*, and *water beech*. It is common in moist places east of the Rocky Mountains. Its bark is smooth except on some old trees. It has a texture like that of beech bark, but its color is blue-gray. The slender trunks are bumpy and swollen in ridges under the close-fitting bark. These trees seldom grow more than twenty feet tall. Their

Brownell

Fruit of This Ironwood, or Hornbeam, Tree is so much like hops in appearance that the species is called the hop hornbeam. The large shiny leaves have edges like saw teeth.

crooked branches bend easily, and people sometimes weave them together to make arbor walks in parks and gardens. The wood is very hard and strong, like that of the hop hornbeam. In some parts of the United States, the name ironwood is also used in referring to the basswood tree. W.M.HAR.

Classification. The ironwoods belong to the family *Betulaceae*. The hop hornbeam is *Ostrya virginiana*. The American hornbeam is *Carpinus caroliniana*.

IRONWORKER. See BUILDING TRADE (Vocational Opportunities).

IRON WORKERS, INTERNATIONAL ASSOCIATION OF. See INTERNATIONAL ASSOCIATION OF BRIDGE AND STRUCTURAL IRON WORKERS.

IRONY. A displeased mother may say to her young son in a certain tone of voice, "You certainly are a nice boy." He understands at once that she really means the opposite of what she says. She has passed her meaning on to him in an indirect way. This is called *irony*, from a Greek word which means *to cover up* or *to hide*. It is a very powerful figure of speech, often used in accusing someone. In his speech over Caesar's body, Anthony refers several times to the "honorable" men whose daggers have stabbed Caesar. He really meant they were dishonorable. By his ironical use of *honorable* he stirs up his hearers to a frenzy. The irony of Job is kindly rather than bitter when he can no longer endure his friends. He says, "No doubt but ye are the people and wisdom will die with you."

When events turn out unpleasantly opposite from expectations we call it "the irony of fate." T.C.L.

See also HUMOR (Types of Humor).

IROQUOIAN, *IHR oh KWOY an*. See INDIAN, AMERICAN (Languages, Signs and Signals; Tables of Tribes).

IROQUOIS, *IHR oh quoy*. See FIVE NATIONS; INDIAN, AMERICAN (Eastern Woodsmen; Table of Tribes).

IRRADIATION, *ih RAY dih A shun*. See FOOD PRESERVATION (Canning Milk).

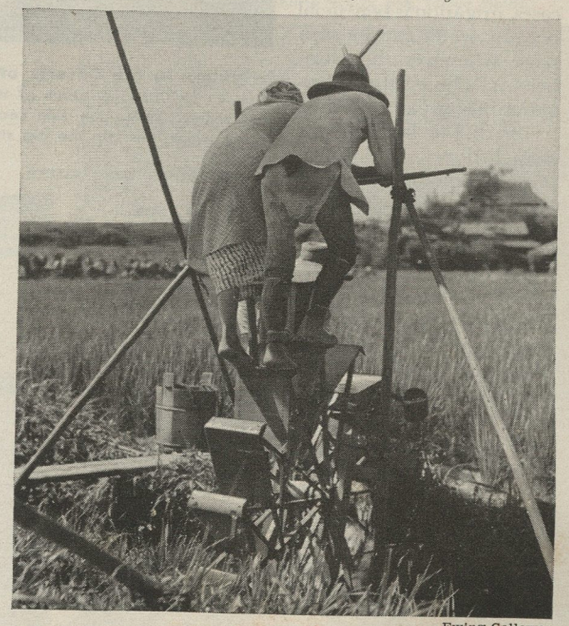
IRRAWADDY, or **IRAWADI,** *ihr ah WAH dih*, **RIVER.** This is the chief river of Burma. It flows about 1,500 miles southward through some of the most colorful scenery in the country. The Irrawaddy rises in a high rocky region in northern Burma. It flows through a thickly populated area down to the broad rice fields of the coast. Here the river enters the Bay of Bengal through many mouths that form a delta of rich farm land.

The banks of the river have been diked for about 100 miles inland to protect the countryside from floods. The city of Rangoon lies on the eastern delta but is not on the Irrawaddy itself. Small steamers can sail up to Bhamo, which is 600 miles inland. G.B.CR.

IRREDENTISM, *IHR ee DEN tiz'm*. See ITALY (Government and History [Modern Kingdom]).

IRRIGATION, *IHR ih GAY shun*, is the watering of plants by artificial means. The sprinkling of lawns and home gardens and the watering of potted plants are examples of irrigation on a small scale. The kind of irrigation that is most important to man, however, is supplying water to farm crops.

Without irrigation there could be no farming in dry regions. Millions of acres of rich land which are now covered with productive farms and which support prosperous communities would still be wasteland and desert, a land of cactus and sagebrush, coyotes and jack rabbits.



Ewing Galloway

Man Power Pumps Water for Irrigation in Japan. Here a Japanese farmer and his wife push a simple but effective paddle wheel that lifts water from a stream to the rice paddies.

Irrigation has been practiced in simple ways for thousands of years by peoples in many parts of the world. But only since the late 1800's has man applied scientific knowledge to watering dry waste places so that they become fertile land.

Different plants need different amounts of water for life. But all kinds of plants require some water for life and growth. Irrigation is necessary if water does not come to them in the proper amount and during the proper seasons in the form of rain or of water seeping through the soil. As a rule, land that receives less than ten inches of rain a year will not produce crops of any sort without regular and plentiful irrigation.

Where the rainfall is between ten and twenty inches a year, certain crops can be grown without irrigation if dry-farming methods are used. (See DRY FARMING.) But the yield of crops from dry farming is low and uncertain. Periods of drouth often occur even in regions where the total yearly rainfall is ample. In other places, there is enough rainfall, but the distribution of rain during the growing seasons is irregular and unsatisfactory for plant growth. This is true in regions where most of the rain falls during the winter, and the summers are dry. In all these cases, irrigation is beneficial because water can be supplied whenever the crops need it. The results of irrigation are greater productivity of the land, fewer crop failures, and more prosperous communities in regions that once were barren.

Pix

Irrigation in the Deserts of Libya is very ancient. At this well, an ox lifts a goatskin of water from the well by a rope and pulley. When the skin reaches the pulley it dumps the water, which runs into the big stone storage tank.

How Water Reaches the Crops

In general, water for irrigation is taken from the most convenient and dependable source available. A hillside spring often supplies the water for a farmer's vegetable garden or home orchard. In large-scale irrigation by means of dams and canals, water is led from rivers and streams to farms that may be hundreds of miles away. Dams are built to hold back water in great artificial lakes called reservoirs. This is water that otherwise would run off the land and be lost in so far as its value to farm crops is concerned. Much water for irrigation is pumped from wells which tap the great supplies of *ground water* that lie beneath the soil. About one out of every three acres of irrigated land in the United States receives its water from underground sources. The energy for pumping this water is supplied by windmills, gasoline engines, and electric motors.

Most of the water distributed to farm lands in the United States and Canada is run on to the farms through open ditches. The main ditch, or canal, takes water from the source of supply. Smaller ditches, called *laterals*, leave the main ditch at regular places and take the water to the fields. Special gates, called head gates, regulate the flow of water into the laterals and shut it off when it is not needed.

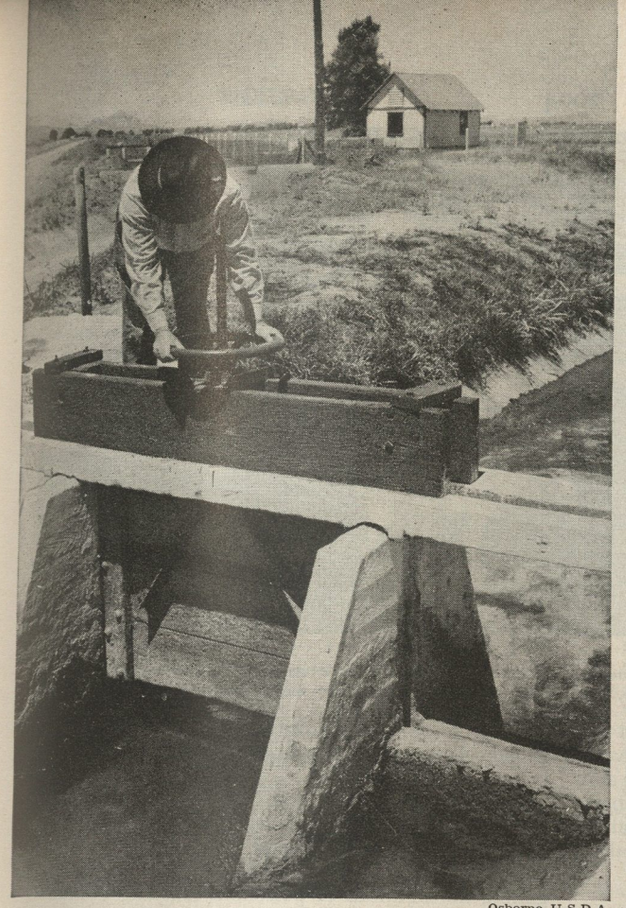
The method by which water is distributed to farm lands is determined largely by the crop. Fields of alfalfa, wheat, and other grains usually are flooded. A small portable dam, made of a canvas-covered metal frame or of a sheet of galvanized iron, is placed across the ditch to divert the water. This floods a small area of the field. The dam is then moved and the process is repeated until the entire field is flooded. Crops which are planted in rows, such as small fruits, potatoes, tomatoes, corn, and beets, usually are irrigated by running the water in small ditches between the rows.

For the best results, the main irrigation canals should be lined with concrete to prevent the loss of water by seepage through the ground. Seepage not only means a waste of valuable water, but it often increases irrigation costs greatly.

In some cases, water is distributed through buried concrete pipes instead of open ditches. These pipes have spaced openings which can be opened and closed by metal valves. Another way in which water can be brought to irrigated fields is by galvanized iron pipes that are laid above the ground in sections that can be connected easily while water is flowing through them. Whenever the watering of one plot is completed, and another is to be irrigated, new sections can be slipped onto the ends of the pipes already linked.

Preparation of the Land

Whatever the method of irrigation, the land must be graded or leveled before the crops are planted. This leveling is necessary so that the water will flow smoothly and evenly over the land. A slope of from ten to twenty feet to the mile will allow the water to flow freely, yet slowly enough so that it will not waste the soil away. This is usually all the preparation land will need for irrigation in the furrows of crops planted in rows. Land that slopes more steeply must be prepared further to hold irrigation water. This is done with *checks*, which are small level plots surrounded by low ridges to hold in the water. Another device is the use of *terraces*, which are long curving plots bounded by ridges that run crosswise of the slope of the land. Both of these methods not only hold the water, but also prevent erosion, or the carrying away of topsoil.

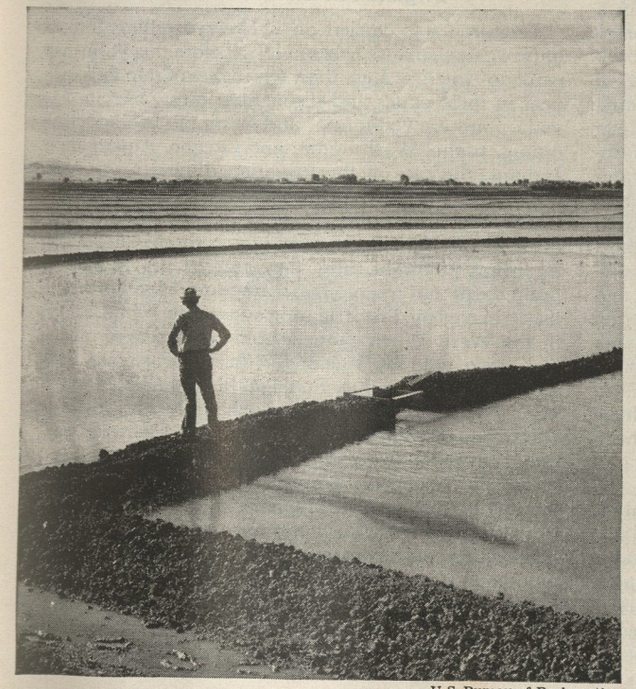


Osborne, U.S.D.A.

The Desert Blooms as water rushes through an irrigation canal gate on its way to farms in former wasteland.

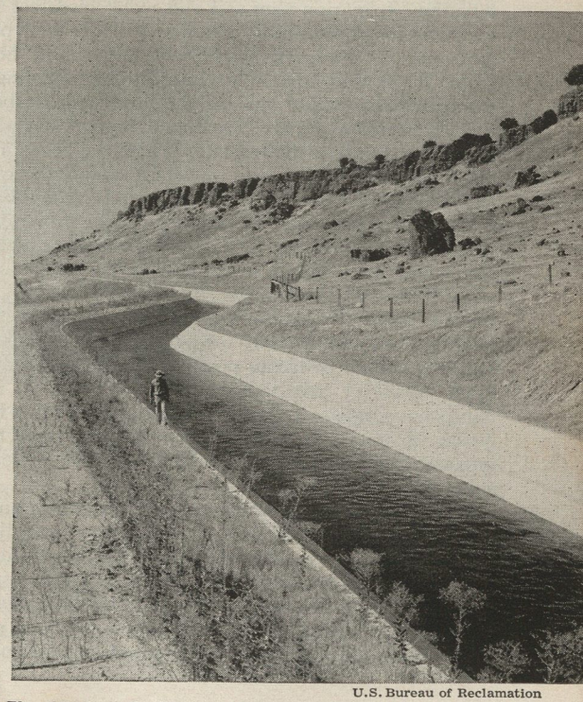
U.S. Bureau of Reclamation

Life-giving Water Bubbles onto the Flat Dry Land of Southern California and turns it into rich, fertile fields.



U.S. Bureau of Reclamation

Rice Fields in the Sacramento Valley of California are flooded, and young rice shoots push up above the water.



U.S. Bureau of Reclamation

The Madera Irrigation Canal in California carries water to farms past the stony cliffs of typical desert country.

Ewing Galloway

This Ancient Ox Pump Still Operates in Egypt. Water is just a few feet below the surface in the fertile Nile Valley. This crude bucket wheel dips it up as a boy drives his oxen in a circle to provide power for the ancient machine.

Crops, such as strawberries, that are planted on raised beds, are irrigated by water in ditches between the beds. The water soaks into the sides of the beds and reaches the plant roots from below. With this method, the top of the bed remains dry. This reduces the spoiling of the fruit by mildew and rot. Such irrigation is called *underbed irrigation.*

Irrigation and Conservation

Scientific irrigation is among the chief phases of conservation. Irrigation uses soil and water resources in a way that contributes most to human welfare. With proper irrigation practices, soils yield larger and better crops. Water that falls on land unsuited for farming, or that otherwise would run off the land without being used, is carried to areas where the soil is good, but where the water supply is inadequate. Where the yearly rainfall is ample, but all comes in a short season, the water can be stored for use in the long dry season that follows.

A much greater variety of crops can be grown with irrigation than without it. These crops include orchard fruits and nuts, small fruits and berries, vegetables, sugar beets, flax, cotton, rice, and many field, hay, and pasture crops. Irrigation reduces the number of crop failures from drouth and other causes, and makes a higher standard of living possible in the particular region. Wherever irrigation has been introduced, farm values have increased, better schools and churches have grown up, more recreational opportunities have been provided, and community welfare has been increased generally.

The best results are obtained from irrigation only if the water resources are used wisely. Water is available for less than one out of every ten acres of land suitable for irrigation in the dry regions of the United States. Only the better lands, therefore, should be irrigated. Many soils contain too much alkali to produce good crops. Other soils do not contain enough minerals or are too stony for good crops. Such soils are called *submarginal soils.* It is foolish to irrigate submarginal soils when better soils are available.

Sometimes the water sources are plentiful, but are unsuited for irrigation because the water contains too much salt or alkaline mineral, or even chemicals that are poisonous to plants. If such waters are used for irrigation, the injurious or poisonous substances accumulate in the soil and make it worthless for farming.

Irrigation in the United States

Irrigation was carried on by town dwelling Indians of New Mexico and Arizona long before the white man came to America. Less than ten inches of rain falls each year in these states and throughout most of Utah, Nevada, southern California, and parts of Colorado, Wyoming, Idaho, Washington, and Oregon. Among these Indians, the care of the irrigation ditches was a community responsibility in which everyone shared.

The Spaniards who came to America knew something of the irrigation system which the Moors had established in Spain, and they taught the Indians to build dams and reservoirs. In 1847 the Mormons established one of the first irrigation systems for white farmers in the West. When pioneer gold seekers were mining California gold by washing it from the stream beds, many ditches were dug. Some of these ditches afterward proved valuable as irrigation ditches. Until the late 1800's, there were only a few thousand acres of land under irrigation in the United States.

In 1894 Congress adopted the Carey Act, which granted land to states and territories which would build irrigation systems. Few states or territories took advantage of this act, however, and in 1902 a Federal Reclamation Act gave the United States Department of the Interior the power to construct irrigation systems with funds obtained from the sale of public lands in the states mentioned in the Carey Act.

The states and territories covered by the act at the time of its passage were Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North and South Dakota, Utah, Washington, and Wyoming. Later, Texas was added. The Reclamation Service was created in the Department of the Interior to take over executive and financial details of irrigation-project construction. Since 1924 this division has been called the Bureau of Reclamation. This bureau has steadily increased its activities since that time. Bureau of Reclamation projects have been extended to Arkansas, Kansas, Louisiana, Missouri, Oklahoma, Oregon, and Tennessee. The total area under irrigation, including irrigation enterprises of all types, is more than 25,000,000 acres. The Bureau of Reclamation alone provides irrigation for about 6,000,000 acres of land.

The bureau has built some of the largest dams and reservoirs in the world. These include Boulder (Hoover) Dam, over the Colorado River, the highest dam in the world (726 feet). Lake Mead, its reservoir, is the largest in the world.

Engineers of the bureau have displayed the highest skill in constructing many of these projects. In mountain regions, concrete tunnels have been built to carry water from one level to another. A tunnel more than five miles long carries water to 200,000 acres of land near Gunnison, Colo. Water is sometimes carried across river beds and up and down mountain slopes by means of huge pipe siphons. A siphon 955 feet long carries water underneath the bed of the Colorado River to the Yuma irrigation project in Arizona.

Irrigation in Canada

Large areas of western Canada receive so little rainfall that it has been found necessary to irrigate them. Many of the Canadian irrigation systems are small, and have been built by private individuals or companies. The Dominion Government grants licenses to those who wish to develop irrigation systems and, in some instances, has assisted the development of these projects with loans of money.

One of the largest of the Canadian irrigation systems was constructed in the province of Alberta by the Canadian Pacific Railway. The water of the Bow River is caught in a reservoir near Bassano and diverted to about 500,000 acres of farm land. About the same amount of land is irrigated by water from the reservoir of the Horseshoe Bend Dam, which is situated on the Bow River near Calgary, Alberta.

Irrigation in Other Lands

For many years India has ranked first among the countries of the world in the amount of irrigated farm land. The crop failures and famine which have brought disaster to many millions in India have always followed periodical failures in the rainfall. After 1885 the British Government built many canals and water-storage projects in an effort to solve this problem with irrigation. The Indian peninsula as a whole, including the Dominion of India and the Dominion of Pakistan, has more than 50,000,000 acres of irrigated land.

The natives of Egypt have practiced irrigation for more than 4,000 years. At first they simply carried water from the Nile River in jars, or diverted it to the land through simple dams and canals. But these early irrigation systems depended entirely on the usual yearly flooding of the Nile. A year of low water meant famine. In order to provide constant irrigation, the British Government in 1902 completed construction of the great Aswan Dam to hold back and store flood waters that could be used during periods of drouth. The dam has been enlarged twice. It now has a storage capacity of 4,800,000,000 tons of water. About 7,000,000 acres of farm land in the Nile Valley have been made fertile.

Other countries with considerable areas of irrigated lands include the Soviet Union, France, Italy, Spain, China, Japan, Australia, Iraq, and Mexico. It has been estimated that more than 100,000,000 acres of land throughout the world require artificial watering. C.D.D.

See also AQUEDUCT; DAM (with list); DRY FARMING; RECLAMATION OF LAND; RESERVOIR.

Questions

About how much land is suitable for irrigation in the United States?

Have you ever done any irrigation? Explain.

Why may land need irrigation even where the yearly rainfall is plentiful?

Why must land be graded before irrigation? How much slope is desirable for irrigated land? Why?

What is meant by each of the following: (a) lateral? (b) check? (c) terrace? (d) underbed irrigation?

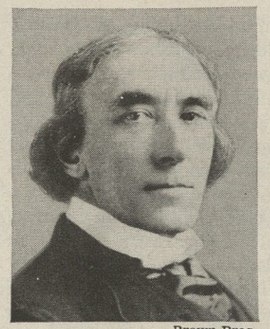
What are submarginal lands? Should they be irrigated? Why or why not?

Where in America did people irrigate hundreds of years ago?

What country in the world has the most irrigated land? Why is irrigation especially needed in that country?

IRRITANT. See POISON.

IRVING, HENRY, SIR (1838-1905), was the leading English actor of his time. In 1876 he took over the management of the Lyceum Theatre, London. For years Ellen Terry co-starred with him. They made many tours of the United States and Canada.



Brown Bros.

Henry Irving, an English clerk who became one of the greatest Shakespearean actors

Irving was born in Somerset. His name was originally John Henry Brodribb. He was a clerk in London for a time before he went on the stage. Queen Victoria made him a knight in 1895. B.M.

His Roles included leading parts in *The Bells; Eugene Aram; Hamlet; Macbeth; Richelieu; Richard III; Othello; Becket;* and *The Cup.*

IRVING, WASHINGTON (1783-1859), was the first American writer to gain fame abroad as well as at home. Readers today still enjoy his short stories and essays. They find in them a reflection of the author's own sense of humor, natural charm, and pleasant disposition. His characters, Rip Van Winkle and Ichabod Crane, bring chuckles to new generations of readers, while New Yorkers regard his Knickerbocker legends as an enjoyable part of local history.

Carefree Youth. Irving was born April 3, 1783, in New York City. His Scottish father had come there as a merchant a few years before the Revolutionary War. The boy was the eleventh and last child of the family. He was named for George Washington. His older brothers encouraged his interest in reading and writing. He loved poetry and books of travel, but disliked school, and left it when he was sixteen.

Chi. Hist. Soc.

Washington Irving, American author of the Knickerbocker Tales

Irving then entered a law office, but he took the study of law no more seriously than he had his school work. He preferred to ramble over the Sleepy Hollow region or to sail up the Hudson and Mohawk rivers. New York City at that time held less than twenty-five thousand people, and Irving often visited the near-by Dutch farmers.

Early Literary Career. In 1802 under the pen name of *Jonathan Oldstyle*, Irving wrote a series of letters for the New York *Morning Chronicle*. They were his first real literary work, and showed a style worthy of Joseph Addison.

His brothers sent Irving to Europe in 1804 because of his poor health. For two happy years he traveled in France, Italy, and England. He had several exciting adventures, met many famous people, and enjoyed the art, literature, and customs of Europe. In 1806 he returned to America, broader in knowledge, culture, and sympathies, as well as much improved in health. He was soon admitted to the bar, but never practiced law seriously.

In 1807 and 1808 Washington Irving, his brother William, and James K. Paulding published *Salmagundi*. This periodical carried essays and sketches in the manner of the *Spectator*, and was popular from the beginning.

At about this time, Irving's fiancee, Matilda Hoffman, died after a short illness. He felt her loss so deeply that he remained a bachelor all his life. To escape his grief, he put the finishing touches on *Knickerbocker's History of New York*. It was published under the name of Diedrich Knickerbocker, but it soon was no secret that Irving was the author of this mock-heroic story.

European Years. In 1810 Irving joined his brothers in the hardware business. Five years later he sailed for Liverpool, where he represented the family interests until the business failed in 1818. Irving then set to work to support himself by writing, and was even able to help support his brothers after his *Sketch Book* was published in 1820.

He had a wide circle of friends in England, and was invited to visit Sir Walter Scott. Scott's interest in folklore gave Irving his first desire to study American folklore. He recalled tales of his own Dutch New York, which he retold in the *Sketch Book* as "Rip Van Winkle" and the "Legend of Sleepy Hollow." Both tales are still read in schools as models of storytelling. In 1822, after a visit to France, he published *Bracebridge Hall*, which has been called an English version of his *Sketch Book*.

Irving published *Tales of a Traveler* after a visit to the Rhine country in 1824. An invitation from the United States Minister at Madrid to translate some Spanish documents took Irving to Spain when he was forty-three. During and after three busy years in that country, he published his *Life of Columbus*, *The Alhambra*, and *The Conquest of Granada*.

In 1829 he returned to England to serve as secretary of the American Legation. The Royal Society of Literature presented him with a gold medal, and Oxford University gave him the degree of LL.D.

Back to Sleepy Hollow. Irving returned to the United States in 1832, after seventeen years abroad. He was welcomed with enthusiasm as a successful American author. His real achievement was that he had interpreted a genial, hearty England to America. Both countries loved him for it.

Brown Bros.

The Return of Rip Van Winkle after his twenty-year sleep in the Catskill Mountains of New York. This well-known character was made famous by Irving in his "Sketch Book."

He purchased Sunnyside, an estate on the Hudson River near Sleepy Hollow. There he spent ten quiet years with his nieces. He refused offers of public office, and filled his time with writing, except for a trip to the Western prairies.

In 1842 Irving was appointed Minister to Spain, and served ably in this office for four years. He then returned gladly to Sunnyside, where he spent the rest of his life. In 1849 he published his delightfully sympathetic *Life of Goldsmith*. After some lesser works, he finished his well-balanced, impartial *Life of Washington*. Soon afterward Irving died, on November 28, 1859, and was buried near Sleepy Hollow. C.Me.

See also Alhambra; Knickerbocker, Diedrich; Knickerbocker, Father; Rip Van Winkle.

IRVINGTON, N.J. (population 59,201). This industrial and residential center lies on the Elizabeth River about ten miles west of Newark. Factories here make machinery, knives, and toys. The city was a shipbuilding center in the 1700's. Irvington was first called Camptown, but the name was changed in 1852 to honor Washington Irving, the author and humorist, who often visited here. R.W.Hat.

IRWIN, WALLACE, and **WILLIAM HENRY,** are two brothers who became well known as writers. They were both born in Oneida, N.Y., and educated at Stanford University.

Wallace Irwin (1876-) became editor of the *Overland Monthly Magazine* in 1902. He won attention as a humorist with such writings in the magazine as "Love Sonnets of a Hoodlum." He also wrote *Venus in the East; Pilgrims into Folly; The Blooming Angel;* and other books.

Brown Bros.

William H. Irwin, magazine editor and novelist

"Will," William Henry, Irwin (1873-1948) was editor of *McClure's Magazine* (1906-1907), but left this work to spend his entire time in writing. He was a war correspondent in Europe in World War I. His works include *The City That Was; Old Chinatown; A Reporter at Armageddon; The Next War; Christ or Mars?;* and *Youth Rides West*. C.Me.

ISAAC, *I zahk*, was the son of Abraham and his wife Sarah in the Bible. Isaac is a much more shadowy figure than Abraham or Jacob. But a very beautiful and well-told story (Gen. 24) tells how Abraham sent his servant to the old home in Mesopotamia in order to get a wife from that place for his favorite son.

The servant reached the home of Abraham and came to a well about the time when the maidens came out to draw water. There he prayed for God to help him. He decided that he would select the one maiden who would not only offer him a drink from her pitcher, but would also offer to water the camels. He had no more than decided this when Rebecca, the niece of Abraham, came to the well. To his astonishment, she did exactly what he had asked for in his prayer. Then the happy servant went to the family of Rebecca. He got their consent to allow her to go to Palestine and become the wife of Isaac.

The story concludes with the meeting of Isaac and Rebecca. Rebecca was seated on a camel. She saw a man coming across the field, and asked the servant his name. He was Isaac. As he approached, Rebecca dismounted from the camel and covered herself with a veil, according to Oriental custom.

Another great story about Isaac tells of the trick played on him by his son Jacob in order to steal the blessing which Isaac had meant to give Esau (Gen. 27).

Ishmael was another son of Abraham. He was born to Abraham by Sarah's maid, Hagar. Isaac and Ishmael represent the traditional ancestors of the Hebrews and Arabs. The Hebrews recognized the Arabic tribe, or Ishmaelites, as the older one. But their interest was in their own ancestor, Isaac. They expressed their feeling of superiority by telling that the Arabs were descended from Abraham's slave girl. The Arabic stories about Abraham and Ishmael represent Ishmael as being the favorite as well as the older son of Abraham. Abraham himself is associated with the traditions of the Arabs, such as the founding of the chief sanctuary of Arabia at Mecca. W.A.I.

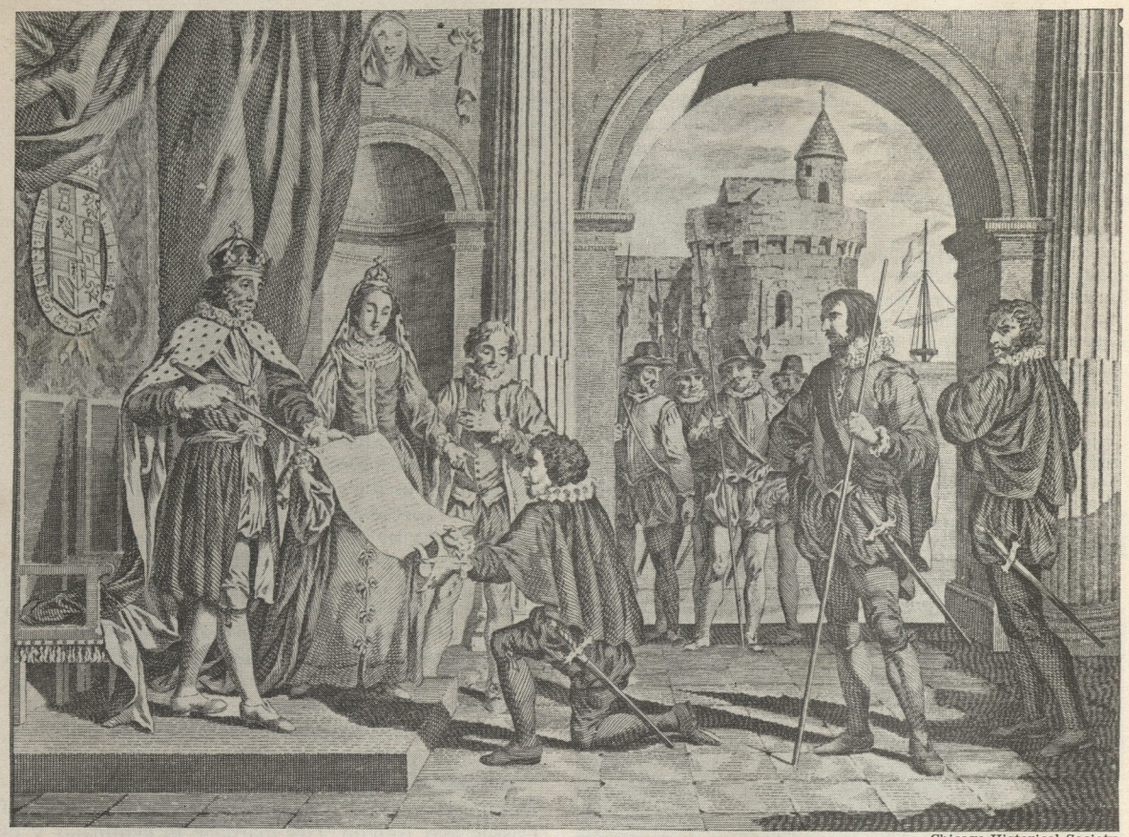
See also Abraham; Ishmael; Jacob.

ISAACS, RUFUS DANIEL (1860-1935). See Reading, Rufus Daniel Isaacs.

ISABELLA I (1451-1504) played one of the most important parts in the history of Spain. She was queen of Castile and Aragon. Her marriage to Ferdinand V of Aragon in 1469 united Spain's two largest kingdoms and laid the foundation of Spain's future greatness. The two rulers together made war on the Moors who

From the painting by Schopin

Isaac Presents Rebecca to His Father, Abraham. The young woman came from her home in Mesopotamia to become Isaac's wife. She had been chosen by one of Abraham's servants because of her kindness in giving water to his camels.



Chicago Historical Society

Isabella and Ferdinand Giving Audience to Columbus after His First Voyage to the New World

held part of southern Spain. In 1492 the Spaniards captured Granada and the Moors were removed from control. Isabella was one of the few persons who saw merit in the scheme of Christopher Columbus to find the Indies by sailing west. Her support of Columbus gave Spain the first foothold in America, thus leading to the growth of the Spanish Empire in the New World. See also CASTILE AND ARAGON (map); COLUMBUS, CHRISTOPHER; FERDINAND V; GRANADA. F.D.S.

Brown Bros.

Queen Isabella I, who worked to drive the Moors from Spain and make it a united Christian kingdom

ISAIAH, *eye ZA yah,* was a prophet of Judah and the first of the great Hebrew prophets. The word *Isaiah* is from the Hebrew language and means *salvation of the Lord.* Isaiah began his prophecies in "the year that King Uzziah died," (Isaiah 6), or about 750 B.C. His work is traced down to 701 B.C. Nothing is known of when or how he died.

The greater part of Isaiah's work as a prophet related to the danger from the Assyrians, who were then conquering all southwestern Asia. In 734 B.C. Syria and North Israel were planning to capture Jerusalem. The young king, Ahaz, asked the Assyrian king for aid. Isaiah had advised against this in his famous Emmanuel oracle (Isaiah 7:13-19). Ahaz soon learned his bitter error, when he came under control of the Assyrians. Twelve years later the Assyrians conquered North Israel. In 701 B.C. the Assyrian king, Sennacherib, swept into Judah, and attacked Jerusalem.

Isaiah looked upon these troubles as religious problems. Why did the Lord permit such wicked attacks and cruelty? Isaiah believed the Lord was using the Assyrians to punish His people for their sins. The people would be saved only if they repented. Isaiah is the prophet of faith: "By returning and rest shall ye be saved, and in quietness and confidence shall be your strength."

The Book of Isaiah in the Old Testament has sixty-six chapters and is one of the longest of the Bible. Modern scholars are agreed that it was written by a number of persons. Isaiah's sayings are found only in chapters 1 to 39. Chapters 40 to 55 are magnificent poems written about 550 B.C. They describe the power of God and His love for Israel. Their purpose was to rebuild the hope and faith of the Jewish exiles in Babylonia. Chapters 60 to 62 are fine poems foretelling the return of the Jewish people to Palestine. W.A.I.

ISCARIOT, *ihs KAIR ih aht.* See JUDAS.

ISCHIA, *EES kyah.* See NAPLES.

ISÈRE RIVER. This river rises in the Graian Alps of southeastern France, and flows for 180 miles in a southwestern direction. It crosses the French Departments of Savoie, Isère, and Drôme to join the Rhone River a few miles north of Valence. In ancient times, the Isère River was called the *Isara.*

ISFAHAN. See IRAN (Cities).

ISHMAEL, *ISH may el,* was the son of Abraham and Hagar in the Bible. He mocked his half-brother Isaac, and was driven with his mother into the desert. They wandered there for many days as outcasts of society. They almost perished with thirst. Then Hagar cried to God. The Lord sent an angel to direct them to a spring and they were saved.

Ishmael married an Egyptian woman. Their twelve sons established the tribe called *Ishmaelites,* as God had promised Abraham He would (Gen. 17:20). Mohammed claimed to be descended from Ishmael. His followers hold that it was Ishmael, not Isaac, who was offered by his father Abraham as a sacrifice to God. W.A.I.

See also ABRAHAM; BEDOUIN; ISAAC.

ISHTAR, *ISH tahr.* See ASTARTE.

From the painting by Sargent

The Prophet Isaiah taught that God was the creator of the universe. He called on men to be just and kind.

ISINGLASS, *I zing GLAHS,* is the purest form of animal gelatin. It is a tough, semitransparent whitish substance which is prepared from the air bladders of certain fish. The best-quality isinglass comes from the Russian sturgeon. But it may also be taken from the cod, hake, and other kinds of fish.

To prepare isinglass, the bladder is taken from the fish and washed in cold water. Then the black outer skin is taken off. The rest is washed and spread on a board to dry. After it is dry, the bladder is dampened in warm water, and the inner skin is taken out by rubbing and beating. It is then passed between iron rollers which reduce it to a thin, partly transparent ribbon which looks a little like watered silk. The partly transparent sheets used in the panels of stove doors are sometimes incorrectly called isinglass. They are actually made of the mineral mica.

Isinglass is used widely to purify wines, beers, and other liquors. It may also be used in jams, jellies, and soups.

ISIS, *I sis,* was the most important female goddess of the Egyptians. She was both sister and wife to Osiris, and was the mother of Horus.

Isis taught farming to the Egyptians, and had skill

From the painting by Liska

Ishmael Lies on the Desert Sands while his mother, Hagar, prays that they be spared from death by hunger and thirst. The Moslems believe Ishmael was their ancestor. He and his mother are said to have been buried in the sacred city of Mecca.

in magic and healing. She was worshiped in Memphis, and later throughout Egypt and Greece. The religion of Isis was brought to Rome about 86 B.C. But the evil actions of her priests made the Romans try to stop it.

In art Isis is represented as wearing a crown of cow's

A bas-relief

Isis Was the Goddess of Nature in Ancient Egypt. She was the goddess who ruled over fruitfulness and motherhood.

horns. Sometimes the disk of the sun is on her head. A lotus scepter is in her hand. P.COL.

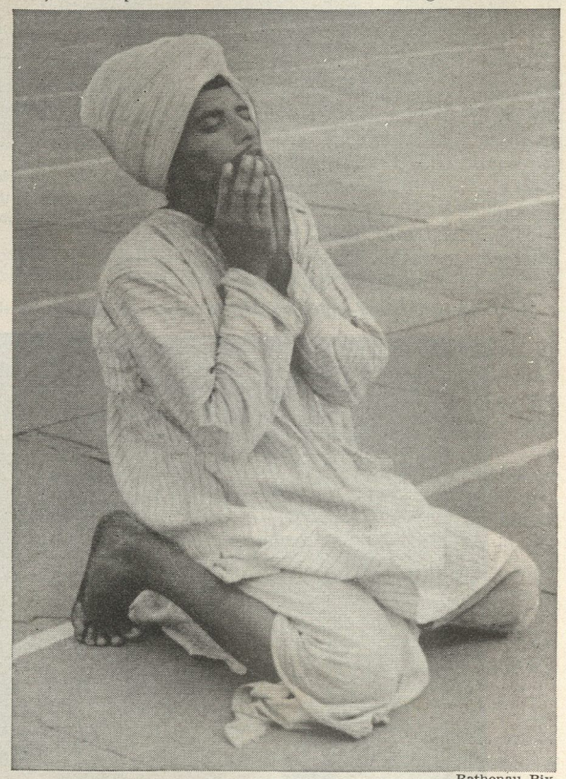
See also OSIRIS.

ISLAM, *IHS lahm*, or *IZ lahm*, is the name of the religion taught by Mohammed. His followers believe that there is one God, or *Allah*, as they call Him, and that Mohammed was His Prophet. They are called *Moslems*. Sometimes Western peoples call them also *Mohammedans*, and their religion, *Mohammedanism*. Islam is the chief religion in Arabia, Africa, parts of India, Western and Central Asia, China, the East Indies, and the Balkans. There are over 250,000,000 Moslems in the world. The word *Islam* is sometimes used to mean the Moslem world or all the followers of Mohammed. In this sense Islam refers to the very powerful political unity that generally exists among the Moslem countries.

Origin of Islam. Islam began in Arabia during the 600's with the teachings of Mohammed. He felt that he was called to be a prophet of God to the backward and heathen Arabian tribes. At first he preached and taught anywhere, at any time that he could get together a few listeners. He lived in Mecca, but for a long time most of the people of that city scorned his teachings. In fact everyone except a few faithful followers became so hostile toward him that he was forced to flee to the nearby city of Medina. This flight is called the *Hegira*. The Moslems consider it so important that their calendar dates from the time it took place.

Teachings. Mohammed told the Arabs about Christ, whom he called the Word and the Spirit of God. He told them that Abraham, Moses, and all the prophets of God taught essentially the same things. He called these teachings Islam, which is an Arabic word meaning *submission*. It is generally accepted as meaning complete submission of body and soul to the will of God, or Allah. Mohammed said that obedience to God results in unity and brotherhood, righteousness and peace.

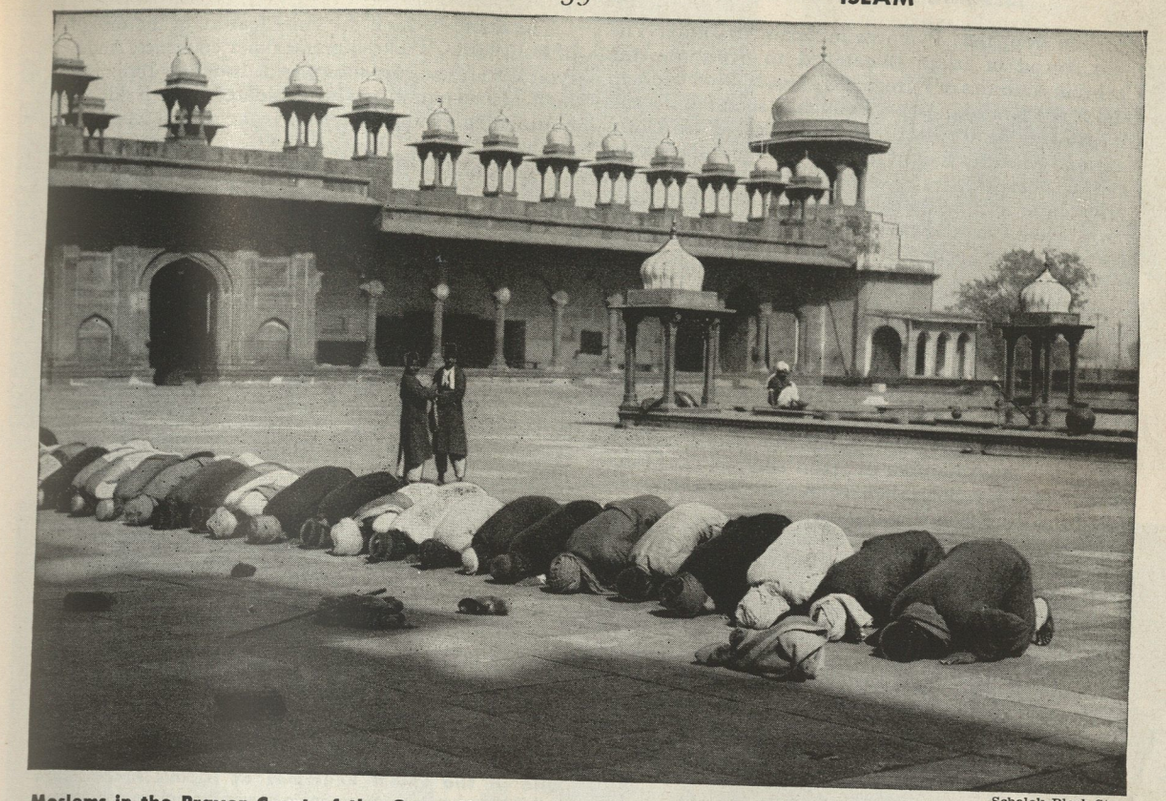
Mohammed made the laws of the Old Testament the foundation of his teachings. He laid especial emphasis on the First Commandment—*Thou shalt have no other gods before God*. He considered this an absolute necessity, for at that time the Arabs worshiped idols when they worshiped at all. He called God the Light of heaven



Rathenau, Pix

A Devout Believer of Islam Prays in the enclosure of a mosque in Delhi, India. The intense concentration and body position are typical of pious Moslems at prayer.

and earth, the Compassionate, the Merciful. The first duty of the devout Moslem is to profess his faith by stating, "There is no god but Allah; Mohammed is the messenger of Allah." These are the words chanted by the crier, or *muezzin*, who calls the Moslems to prayer.



Schalek, Black Star

Moslems in the Prayer Court of the Great Mosque at Agra, India, answer the call to prayer. Their religion is Islam, which was founded by Mohammed and is one of the world's largest. Islamic churches are noted for their intricate decoration.

Mohammed bade his followers to pray five times every day, telling them that their strength came from heaven. Their first prayer must be at dawn. The teaching of Jesus to forgive and be kind was also stressed by Mohammed. In essence, he told his followers that they must not kill, steal, be guilty of envy, or commit adultery. They must give to the poor, protect the orphan, be honest in business, keep their promises, and not deal in moneylending. He told them to respect Jews, Christians, and others who have a holy book. He commanded all Moslems to treat their slaves with kindness, and taught that to set a slave free would win the approval of Allah.

Mohammed bade his followers refrain from strong drink, and most of them did. He told them that they must fast each year from sunrise to sunset during the month they call *Ramadan*. He said it would be well if they made a pilgrimage to Mecca, their holy city, at least once during their lifetime.

The Koran. The teachings of Mohammed were written down by his companions on whatever materials could be found, such as palm leaves or the dried skin or bones of sheep. These were collected by his followers and later put together to form the holy book of the Moslems, called the *Koran*. The Koran tells of a judgment day. It promises to reward the faithful with the gardens of paradise. But those who do not carry out the commands of God will suffer the flames of hell. These teachings were a mighty force for social control. Many modern Moslems interpret these principles as spiritual symbols. They regard the paradise in which rivers flow as a spiritual state in which the river of knowledge flows freely. The maidens, or *houris*, of paradise are angels.

The Koran permits a man to marry more than one wife. This practice is known as *polygamy*. During the time of Mohammed, an Arab had as many wives as he could afford, as did some of the heroes of the Old Testament. Mohammed told the Arabs that they should limit the number to four. But he said that no man could have that many unless he could treat them all with justice. Some of the best Moslems think that no man can treat four wives equally well, so they limit the number to one.

After the death of his beloved wife, Khadija, Mohammed had a number of wives. He was the political ruler of the Arabs as well as their religious leader. Since the rulers of his day practiced polygamy, Mohammed followed the custom in part for political reasons. His favorite wife of later years was Aishah, the daughter of his faithful friend and follower, Abu Bakr.

The Spread of Islam. After Mohammed died in A.D. 632, Abu Bakr was elected as his successor, or *caliph*, as he was called. Omar, a mighty warrior and a strict ruler, followed Abu Bakr as the next caliph. Omar and his successors permitted wars of conquest as "holy wars." Within a century they built up an empire which

stretched from the Pyrenees in Spain to India. The rapid spread of Islam threatened to overthrow the Christian countries of Europe. As a result, both Moslem caliphs and Christian popes frequently sounded the call to "holy war" in the centuries that followed. So Christians and Moslems fought many battles and long wars, of which the Crusades are the best known.

In spite of all this, the Moslems converted some two-thirds of the Christians of Africa and Asia, and made converts among members of other faiths. They united millions of different peoples into one great brotherhood. They established a splendid civilization in Mesopotamia, Persia (now Iran), Palestine, North Africa, and Spain. They taught the Western nations the "Arabic" numerals of India. They gave to the world algebra, many crafts, and much of early chemistry and medicine. They brought to the Western World paper from China, and knowledge of Plato, Aristotle, and Greek science. They built the Alhambra in Spain and the Taj Mahal in India. Some scholars believe that they may have inspired the European Renaissance.

Sects. After a while the Moslem world divided into two great sects, the *Sunnites* and the *Shiahs*, or *Shiites*. Later, each of these broke up into many other sects. The Sunnites believed that the rightful caliphs after Mohammed were Abu Bakr and Omar. The Shiahs believed that the rightful successor was Ali, the cousin of Mohammed and husband of his daughter, Fatima. The Shiahs, though less numerous, have always challenged the Sunnites for religious and political leadership. Most of the Shiahs are to be found in Iran. But there are also large numbers in parts of Arabia, Iraq, North Africa, and India.

A later prominent Moslem sect was founded by Abd-al-Wahhab in the 1700's. His followers are known as *Wahhabis*, and they are the Puritans of Islam. They carried their creed into parts of Egypt, North Africa, Turkey, India, and Central Asia. In the 1800's they were driven out of Central Arabia. But in the 1900's they recovered this territory and conquered the Hejaz with its holy cities of Mecca and Medina. Their leader, Abd-al-Aziz, is better known as Ibn Saud.

The religious and political unity of the Moslem world is badly broken, but in matters of tradition it still holds together. N.A.

Related Subjects. The reader is also referred to:

Allah	Islamic Architecture
Caliph	Kaaba
Crescent	Koran
Dervish	Mecca
Fakir	Medina
Hadj	Mohammed
Hegira	Moslem
Idol	Mosque

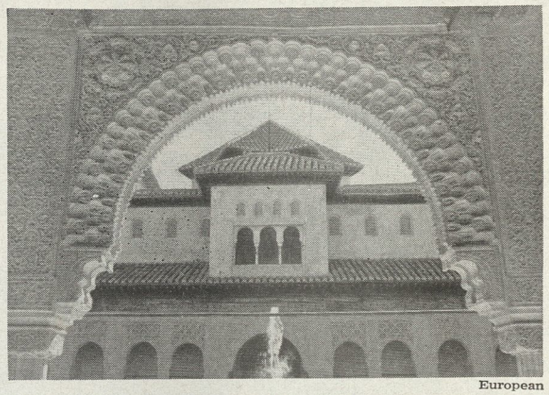
ISLAMIC ARCHITECTURE. The religion called Islam inspired its believers to devote their greatest architectural skills to their houses of worship, or *mosques*.

Early mosques had open courts surrounded by arcades. One of the finest mosques of this type is the Ibn Tulun Mosque at Cairo, Egypt. The essential features of mosques of all periods are the niche, or *mihrab*, and the prayer tower, or *minaret* (see MINARET MOSQUE). A dome was later added over the section which contained the mihrab.

The dome became the chief feature of the mosques of Iran, India, Turkestan and other countries. Another typical feature of the mosques of Iran and India is the high, arched entrance with a minaret on each side. The outstanding example in Iran is the Royal Mosque at Isfahan.

The Turkish mosque has an enormous, enclosed central space covered by a dome and half domes in the manner of Byzantine churches. A court fronts the main structure. The Mosque of Sultan Selim at Adrianople represents the best example of this type.

The second most important kind of Islamic building was the college, or *madrasa*. It was a four-sided structure surrounding an open court. Each side of the structure contained a large, vaulted hall, or *iwan*, which



European

One of the Finest Examples of Islamic Architecture is the Alhambra in southern Spain. It was the palace and fortress of the Moorish kings of Granada, and is built on the southeast border of that city. The Arabic name "Alhambra" means "the red." This probably comes from the sun-dried bricks which were used to make the outer wall. The palace is surrounded by many courtyards and gardens made beautiful by fountains, fragrant flowers, waterfalls, and trees.

opened onto the court. The students attended classes in the iwans, and lived in rooms in the structure. The Mustansirya at Baghdad is a good illustration of such a madrasa.

Some of the most striking examples of Islamic architecture are the tombs. They were either covered with a dome or built in the shape of a high, round tower. The most famous Islamic tomb is the Taj Mahal at Agra, India. Many tomb towers remain in Iran.

The rulers of the various Islamic countries built many palaces, of which only a few remain. The best-known is the Alhambra, at Granada, Spain. Another is the Palace of the Mogul Emperors at Delhi, India.

Other examples of Islamic architecture include inns, or *khans*, hospitals, and market places, or *bazaars*.

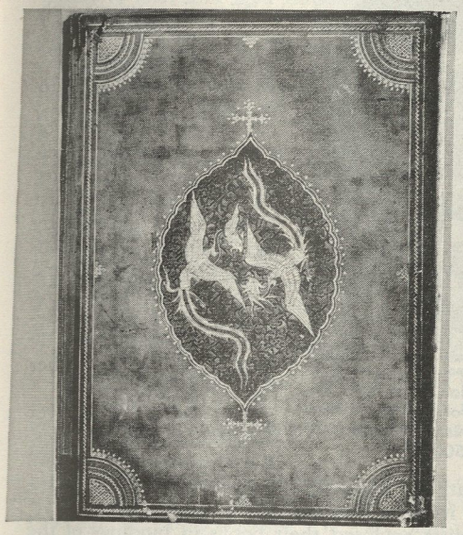
All Islamic architecture displays elaborate ornamentation in stone, stucco carving, glazed tiling in brilliant colors, or marble paneling. Representation of human or animal figures almost never appears on the mosques.

See also ALHAMBRA; ARABESQUE; ISLAMIC ART. M.A-O.

ISLAMIC ART. The Arabs spread the religion known as Islam, and united all the countries they conquered into a single civilization. The Arabs themselves had little or no art. But through their conquests, they came

A Persian Prayer Rug of the 1600's, in Silver and Gold Brocade

An Illustration from a Manuscript



Inside of a Leather Book Cover

A Decorated Persian Bowl

Metropolitan Museum of Art

A Gold Brocaded Turkish Velvet of the 1500's

TYPES OF ISLAMIC ART

into contact with highly developed cultures in Iran, Syria, Mesopotamia, Egypt, and other countries. All the peoples who accepted Islam blended these cultural influences, and developed from them a distinct and fairly uniform style of art known as *Islamic*. It was the product of many countries in an area extending from Spain to India. Local variations appear, but the general relationship remains. Islamic art reached its greatest period of development between about 800 and 1650, and began to decline after 1700.

The artists applied their highest skills to such objects as rugs, book illustrations and bookbindings, glassware, metalware, pottery, textiles, and carvings. The best of these works combine superb mastery of technique, design, and color.

Characteristics. The Islamic artist did not attempt to picture things as they appeared in nature. Instead, he drew natural forms in a purely ornamental way. He also created abstract designs based on geometric or plant forms. The most characteristic Islamic motif is the arabesque. Little effort was made to draw scenes in their true perspective.

The Islamic artist represented forms in this way partly because of his Oriental love for design. But he also did so because his religious traditions said that Mohammed opposed any pictures or figures of living beings. The Moslem holy book, the *Koran*, does not forbid such representations, as is usually believed. Human and animal figures do often appear in Islamic art, especially in book illustrations. But as a rule religious feelings banned the use of objects with such figures in a house of worship, or mosque.

Rugs. The origin of the knotted rug is not definitely known. But Islamic craftsmen developed it into a fine art. They used wool or silk for knotting, and sometimes brocaded the rugs in gold and silver. Some of the finest silk rugs have as many as 5,000 knots in each square inch. Such fine work permitted the richest variations of design and color.

Almost no rugs remain which were made before 1500. Iran produced the most beautiful rugs. But India, Turkey, and other countries also produced splendid examples. Turkish rugs display abstract or geometric designs. The craftsmen of Iran and India preferred floral designs, scrolls, arabesques, medallions, with occasional animal or human figures.

These masterpieces of Islamic rugmaking are not classified according to the places in which they were made, as the more modern Oriental rugs of commerce are. Instead, they are classified according to design, period, and country. They are known as *vase* rugs, *medallion* rugs, *animal* rugs, *arabesque* rugs, or by other names. One group of rugs is called *Polish* because they were made in Iran for export to Poland. Some rugs combine knotting with tapestry weave.

Books. The famous miniature paintings of the Islamic peoples were usually made as book illustrations. The earliest remaining examples were almost all made after 1200. The Arabs illustrated their own literary works. But many of their miniatures appeared in books on medicine, plants, and animals, which the Arabs translated from the Greek. Other popular subjects were the fables of India.

The Iranians had rich literary traditions, and preferred to illustrate epic and romantic poems. A favorite subject was the famous epic, *Shah-Namah*, or *Book of Kings*, by Firdausi. Other works included the romances, *Layla and Madjnun* and *Khosrau and Shirin*, by Nizami, or poems such as the "Bustan" ("Fruit Garden") and prose works like the *Gulistan* (*Rose Garden*), by Saadi.

Metropolitan Museum of Art

A Hunting Scene is engraved on this Iranian silver disk. The hunter on his horse has his hands in position for shooting a bow and arrow, although they are not shown. This skillful piece of metal craftsmanship dates from about A.D. 500.

A number of styles, or schools, of painting developed in Iran as the country was again conquered, first by the Turks and then by the Mongols. These conquests also introduced some Chinese influences. The Mogul artists of India developed a more naturalistic style of painting than other Islamic artists.

The Koran was never illustrated with pictures. But it was often adorned with beautiful scrolls and other ornaments. Arabic writing lends itself to very decorative treatments.

The artists enclosed their books in bindings of the most delicate workmanship. Some Iranian bookbindings of the 1400's are among the most beautiful ever made.

Pottery. See POTTERY.

Glassware. Islamic craftsmen practiced almost all the processes of glassmaking known since ancient times. But the craftsmen of Syria became famous for glass vessels decorated with colored enamels. The origin of this process is unknown. Magnificent mosque lamps were also made in Egypt and probably in Mesopotamia, as well as in Syria.

Metalware. The metal objects manufactured in the Near East were of fine quality. The metalworkers achieved their most beautiful effects by engraving or by inlaying bronze with copper, silver, or gold. They produced elaborately decorated ewers, candlesticks, basins, mortars, and other vessels. The best works were made between about 900 and 1600. The city of Mosul, in Mesopotamia, became the principal center of inlaid bronze work.

Other Crafts. The weavers of Iran, Mesopotamia, Turkey, and other Islamic countries produced a variety of beautiful textiles. Iranian brocaded silks and velvets of the 1500's and 1600's became world-famous. Turkish textiles were copied by the weavers of Venice.

Islamic artists produced little sculpture. But they carved rich designs on objects of wood, ivory, and other materials. M.A-O.

See also ISLAMIC ARCHITECTURE.

ISLAMIC CALENDAR. See CALENDAR (Islamic Calendar).

ISLAND. Any body of land smaller than a continent and completely surrounded by water is an island. There are several different types of islands, including oceanic islands, continental islands, inland islands, floating islands, and so-called land-tied islands.

Oceanic Islands, such as the Hawaiian group, are those which lie in an open ocean far distant from any continent. They may be made up of coral reefs or of masses of land and lava thrown up by deep-sea volcanoes. Coral reefs are found only in warm regions. Islands of lava or land may be found in any region.

Volcanic islands may form suddenly, and may disappear just as suddenly. In 1946 a small island of this type appeared almost overnight about 250 miles south of Tokyo.

Continental Islands are those which lie near a continent. They are made up of the peaks of mountains that rise from the sea, or parts of the continent that are separated from the mainland by a body of water. Such islands usually contain the same kind of plant and animal life found on the continent. Japan, the West Indies, and the British Isles are such continental islands. It is known that at one time they were joined to the mainland or continent near them.

Inland Islands are formed by the action of water currents. Lakes and rivers sometimes deposit in their beds large amounts of materials which finally build up into islands.

Land-tied Islands include islands that are connected with the mainland by sand bars. These islands with their sand bars are called *tombolos*. They are built up by silt, sand, and gravel deposited by shore currents. A tombolo lies off the shore at Marblehead, Mass.

Floating Islands, found in inland waters, are formed of great amounts of earth, driftwood, and roots. Sometimes these islands may be large enough to be used as gardens and pasture lands. Artificial floating islands have been made by covering reed rafts with mud. In China such artificial islands are often used for growing rice. Some floating islands in Mexico are famous for their beauty. They are green with the vegetables and bright with the flowers which native Indians have planted. Flower-filled boats glide between the floating islands, as the Indians take the fragrant blossoms to Mexico City, where they are sold in the open-air market places.

Some of the Largest Islands in the world and their approximate areas are:

Greenland	840,000 square miles; more than three times the area of Texas.
New Guinea	342,232 square miles; nearly three times the area of all the New England states and New York.
Borneo	282,416 square miles; almost four times the combined area of England and Wales.
Baffin Island	231,000 square miles; nearly three times the size of South Dakota.
Madagascar	228,707 square miles; more than the combined area of North Dakota, South Dakota, and Nebraska.
Sumatra	164,165 square miles; a little larger than California and Connecticut.
Great Britain	88,745 square miles; more than the combined area of Pennsylvania, Ohio, and Delaware. W.E.E.

Related Subjects. The following islands are given special descriptions under their titles in THE WORLD BOOK ENCYCLOPEDIA:

AFRICA

Canary, Cape Verde, Madagascar, Madeira, Mauritius, Saint Helena, Zanzibar

ANTARCTIC

Ross Dependency

ARCTIC

Ellesmere, Fridtjof Nansen Land, Greenland, Lofoten, Melville, Novaya Zemlya, Spitsbergen, Wrangel

ASIA

Ceylon, Cyprus, Formosa, Hong Kong, Laccadive, Maldive, Nicobar, Patmos, Rhodes, Sakhalin, Samos, Singapore, Sunda

AUSTRALIA

Norfolk, Tasmania

EUROPE

Aegina, Aland, Azores, Balearic, British Isles, Capri, Corfu, Corsica, Crete, Cyclades, Elba, Euboea, Faeroe, Frisian, Helgoland, Iceland, Ionian, Malta, Melos, Monte Cristo, Salamis, Sardinia, Shetland, Sicily

INDONESIA

Aroe, Bali, Borneo, Celebes, Java, Krakatao, Moluccas, Sumatra

NORTH AMERICA

Aleutian, Anticosti, Cape Breton, Catalina, Chichagof, Dry Tortugas, Ellis, Florida Keys, Governors, Kodiak, Long, Mackinac, Magdalen, Manhattan, Manitoulin, Martha's Vineyard, Mount Desert, Nantucket, Newfoundland, Pribilof, Prince Edward, Queen Charlotte, Sable, Saint Pierre and Miquelon, San Juan, Staten, Thousand, Vancouver, Welfare

PACIFIC ISLANDS

Admiralty
America
Austral
Baker
Bismarck Archipelago
Bonin
Caroline
Christmas
Cook
Corregidor
D'Entrecasteaux
Easter
Ellice
Fanning
Fiji
Gambier
Gilbert
Guadalcanal
Guam
Hawaiian
Howland
Indonesia
Iwo Jima
Jarvis
Kermadec
Kurile
Kusaie
Leyte
Louisiade Archipelago
Loyalty
Luzon
Malay Archipelago
Marianas
Marquesas
Marshalls
Midway
Molokai
Nauru
New Britain
New Caledonia
New Guinea
New Hebrides
New Zealand
Okinawa
Pacific Islands
Palau
Palmyra
Peleliu
Philippine
Phoenix
Pitcairn
Ponape
Ryukyu
Saipan
Samoa
Santa Cruz
Society
Solomon
Tahiti
Tarawa
Tokelau
Tonga
Trobriand
Truk
Tuamotu
Wake
Washington
Yap

SOUTH AMERICA

Falkland
Galápagos
Juan Fernandez
Marajo
Tierra del Fuego

WEST INDIES

Antilles
Bahamas
Barbados
British West Indies
Cuba
Curaçao
Guadeloupe
Hispaniola
Isle of Pines
Jamaica
Leeward
Martinique
Puerto Rico
Saint Vincent
Trinidad
Virgin
West Indies
Windward

ISLAND OF LANGERHANS. See GLAND; PANCREAS.

ISLANDS OF THE BLESSED. See ELYSIAN FIELDS.

ISLE LA MOTTE. See VERMONT (map).

ISLE OF MAN. See MAN, ISLE OF.

ISLE OF PINES. Forty miles south of Cuba, in the Caribbean Sea, lies a beautiful wooded island known as the Isle of Pines. Its name comes from the fact that the hilly northern part of the island is covered with forests of pine, cedar, and mahogany. The island is almost circular in shape and has an area of 1,180 square miles. The southern part is chiefly a flat marshland.

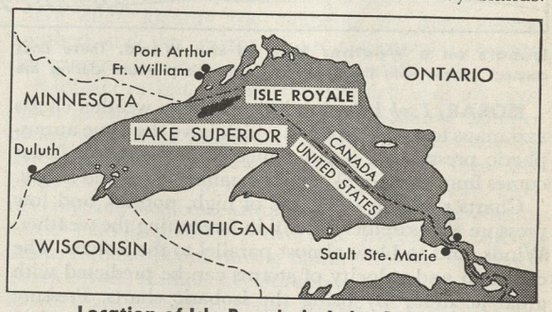
Many fruits and vegetables are raised on the Isle of Pines. The soil is especially favorable to the growth of grapefruit, pineapples, and potatoes. Citrus fruits are exported. There is also a small cattle-raising industry. The island has mineral deposits of several kinds, but most of them are undeveloped. Marble quarrying is the only mineral industry.

About 4,000 people live on the Isle of Pines. Most of them are in the capital city, Nueva Gerona, and in Santa Fé. Both of these cities have modern hotels and health resorts. Tourists and settlers are attracted to the island by its delightful climate and its far-famed mineral springs. People from the United States make up a higher proportion of the population than in any other island off the American coast.

The Isle of Pines belongs to Cuba. After the Spanish-American War, there was some doubt as to who owned it. A treaty negotiated in 1904 confirmed Cuba's claim to ownership. Before this time, Cuba had given the United States a naval base on the Cuban mainland, supposedly in return for American recognition of Cuba's rights to the Isle of Pines. But settlers from the United States colonized the northern section of the island. Their investments totaled about $15,000,000. They believed that the United States Senate would never confirm the treaty negotiated in 1904, and felt confident that the island would remain United States territory. But the Senate, recognizing the merits of Cuba's claim, finally ratified the treaty in 1925. R.PEA.

ISLE OF WIGHT. See WIGHT, ISLE OF.

ISLE ROYALE NATIONAL PARK. This Federal game preserve includes the large island for which the park was named and more than a hundred small near-by islands.



Location of Isle Royale in Lake Superior

The total area of the islands is about 209 square miles. The islands lie in the northwest part of Lake Superior. They belong to the state of Michigan, although they are nearer to the shores of Minnesota and Canada. See MICHIGAN (inset on colored map).

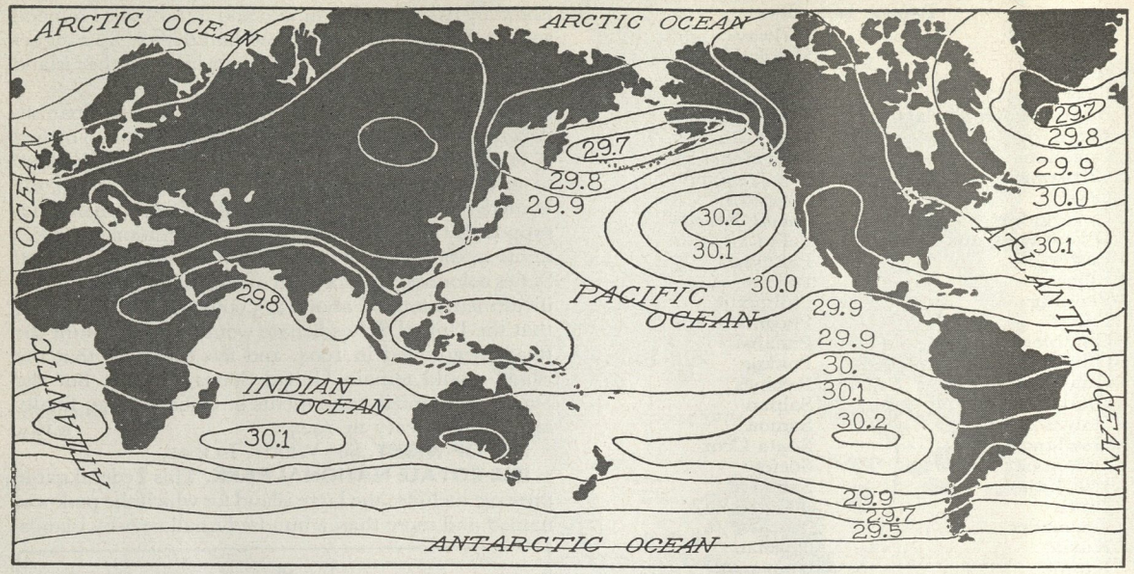
Isle Royale, the largest of the islands, is forty-five miles long and from three to nine miles wide. This island contains more than thirty inland lakes. Lake Siskiwit, which lies near the center of Isle Royale, is the largest of the lakes. It contains several small islands of its own. It is one of the few places in the world where copper is found in an almost pure form. From 1846 to 1883 Isle Royale's copper mines yielded a large amount of metal, but mining since has been largely abandoned.

One of the largest moose herds in the United States is grazed on the island. The park is a refuge for other wild animals, including beavers, squirrels, rabbits, coyotes, and timber wolves. The streams of the island are filled with fresh-water fish. Many kinds of birds live on the islands. Native trees include oak, maple, birch, and evergreens.

Many kinds of flowers grow on the islands. At least thirty varieties of orchids bloom here in the summer. The islands were set aside as a national park in 1940. L.G.V.V.

ISMAIL PASHA, *is mah EEL pah SHAH,* or **ISMAIL I** (1830-1895). See EGYPT (History [Modern Egypt]).

ISMENE, *ihs MEE nee,* was one of the daughters of Oedipus. See OEDIPUS.



Isobars on a Weather Map of the World. These lines connect places with the same average air pressure during the year. Atmospheric pressure is measured in inches and tenths of inches. Pressures shown range from 29.5″ to 30.2″.

ISOBAR, *I soh bahr*, is a line drawn on weather charts and maps to connect places which have the same atmospheric pressure. It is also called an *isobaric line*. *Isobar* comes from two Greek words meaning *equal* and *weight*.

Charts showing the areas of high, normal, and low pressure are extremely useful in forecasting the weather. Winds tend to blow almost parallel to the isobars. The direction and velocity of storms can be predicted with great accuracy by using the isobaric charts. Pressure may be marked on the chart in inches and tenths of an inch, or in a smaller unit called the *millibar*. An isobaric map may show the average pressure for the year or for some shorter period, or it may show the pressure at a particular moment. Charts are issued each day by weather bureaus to show the atmospheric conditions. See also ATMOSPHERE; BAROMETER; WEATHER. J.V.F.

ISOCRATES, *eye SAHK rah teez* (436-338 B.C.), was a great Greek orator. He won his reputation in spite of the fact that he seldom spoke in public. A weak voice and stage fright kept him from making public appearances as a speaker. But he wrote and published many great orations in pamphlet form, and became a distinguished teacher of rhetoric and oratory.

From about 403 to 394 B.C. he wrote arguments to be used in public debates on local issues. Later he scorned this period of his life, and turned to discussion of major political issues. He advocated the union of Greece under control of one state, such as Athens, Sparta, or Macedonia. He also pleaded for domestic peace and good government.

Isocrates found his calling in about 392 B.C., when he set up his famous school of oratory and rhetoric in Athens, his home. The schools of Plato and of the Sophists were his rivals. His pupils included some of the greatest orators, historians, debaters, and writers of the Greece of that day.

Isocrates also continued to write on political questions. He would perhaps have been a journalist or columnist had he lived today. He especially urged a Greek invasion of Persia, which he made the theme of his famous *Panegyricus*, published in 380 B.C.

Twenty-one of his orations are still in existence. They are noted for their polished style and careful form. These orations have been translated into English. J.W.SW.

ISOLATING LANGUAGE. See PHILOLOGY.

ISOLATIONISM, *I soh LA shun iz'm*, is the doctrine of persons who believe that a country should hold itself separate and aloof from other countries. Isolationists believe that it is a mistake for their nation to become involved in international trade agreements, peace treaties, or wars.

ISOMERISM, *eye SAHM er iz'm*, is a chemical term. It means a condition which occurs when two chemical compounds have the same formula, but differ in the way that atoms are arranged in the molecules of the compounds. The compounds are exactly alike in the number and kinds of atoms which the molecules contain. They also weigh the same. But they have different properties. An example of isomerism is *octane* and *iso-octane* gasoline. Both of these gasolines have a chemical formula of C_8H_{18}, which means that the molecules of each type contain eight carbon atoms to eighteen hydrogen atoms. But octane gasoline burns very unevenly in the motors of automobiles, while iso-octane gasoline is considered one of the best types of gasoline there is. The difference between these two gasolines lies in the arrangement of the carbon and hydrogen atoms of each. In *octane* gasoline molecules, the carbon atoms are arranged in a chain, with the hydrogen atoms placed on either side of the carbon atoms and at the ends of the chain. In iso-octane, the carbon atoms are arranged in a chain of five, with other carbon atoms, to which hydrogen atoms are attached, branching off from the chain. The process of rearranging the atoms in molecules is called *isomerization*.

ISOMETRIC, *EYE soh MET rik*, **SYSTEM.** See CRYSTAL.

ISONZO, *ee ZOHN tso*, **RIVER** is a waterway in northeastern Italy. The Isonzo rises in the Julian Alps and follows a southward course for about eight miles before it empties into the Gulf of Trieste. H.U.S.

ISO-OCTANE. See GASOLINE; ISOMERISM.

ISOPRENE. See RUBBER (Chemistry of Rubber).

ISOPTERA, *eye SAHP ter ah*. See INSECT.

ISOSCELES, *eye SAHS eh leez*. See TRIANGLE.

ISOSTASY, *eye SAHS tah sih*. See EARTH (Shape, Size).

ISOTHERM, *I soh thurm*, is a line drawn on maps to connect places which have the same temperature. It is also called an *isothermal line*. The geographer constructs a monthly isothermal map by first averaging all the temperatures at any one place during the month to find the average, or *mean temperature* for the month. Then he draws isotherms connecting places which have the same average. The average temperatures for the year are used in making a yearly map.

Places which have the same latitude on the map often vary in temperature, and so isothermal lines are very irregular. They curve back and forth, up and down over the map. There is the greatest irregularity in the Northern Hemisphere where great land masses are separated by large water areas, because temperatures vary on land and water in the same latitude. In the Southern Hemisphere the oceans are larger, and there is less land. The isotherms follow the parallels of latitude more closely, growing cooler as they go farther south.

A line drawn near the earth's equator, through the middle of the belt which has the hottest climate, is called the *heat equator*. This isotherm connects places having an average temperature of about 80° F. Weather bureaus issue daily isothermal charts. J.V.F.

See also CLIMATE; WEATHER.

ISOTHERMAL LAYER. See STRATOSPHERE.

ISOTHERMAL LINE. See ISOTHERM.

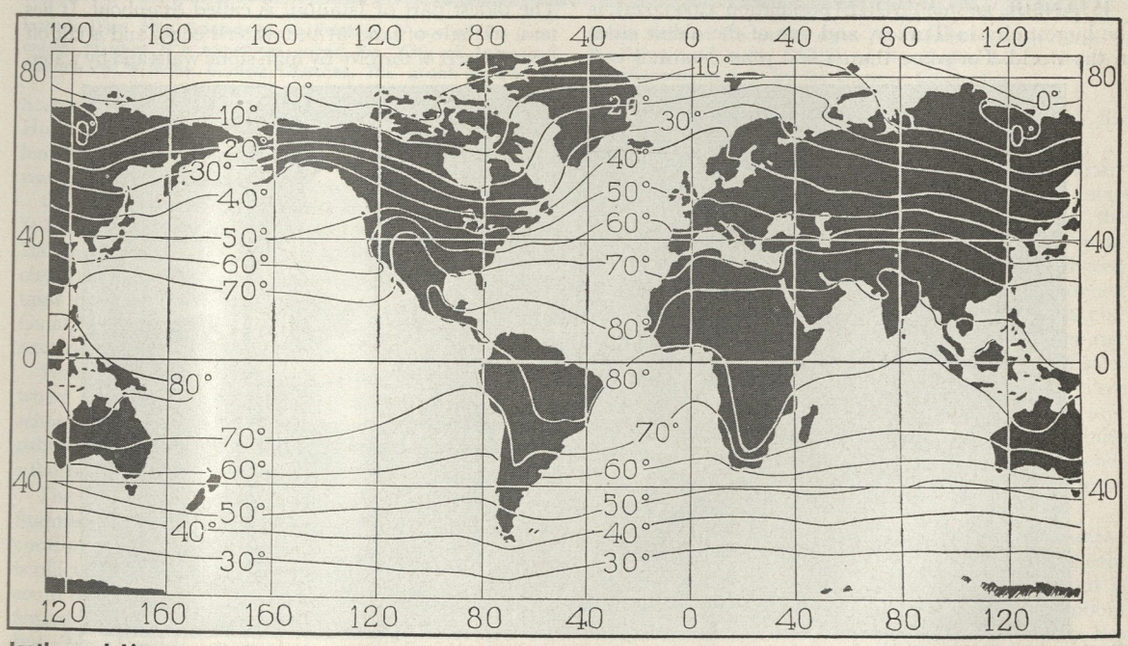
ISOTOPE, *I soh tohp*. Isotopes are atoms of the same chemical element which have different atomic weights. They have slightly different physical properties, but the same chemical properties. The heavier isotopes of an element have additional particles, called neutrons, in the nucleus. These give the extra weight.

A table of atomic weights will show many elements with fractions in their weights. Chlorine weighs 35.46, and mercury 200.61. The reason is that these elements contain different isotopes, with different weights. The atomic weight is merely an average for all the isotopes.

Isotopes are not easy to separate, and their differences are not usually great. An exception is hydrogen. Its three isotopes, protium, deuterium, and tritium have atomic weights of 1, 2, and 3. Deuterium is twice as heavy as normal hydrogen, so the hydrogen isotopes differ more than any others. Deuterium oxide, D_2O, is called "heavy water." Another notable exception is uranium 235. It was very important in the development of a practical method of releasing atomic energy.

We often identify the elements by their atomic numbers and the weight of some particular isotope. For example, uranium 235 is written $_{92}U^{235}$.

Radioactive isotopes are those which give off rays, much as radium does. Work with radioactive isotopes makes up a huge proportion of all scientific research. The constantly increasing knowledge about these isotopes is being used in many sciences—chemistry, biology, physics, medicine, astronomy, and geology. Radioactive carbon isotopes permit the tracing of carbon atoms through plants during photosynthesis. (See PHOTOSYNTHESIS.) Radioactive phosphorus helps the surgeon locate brain tumors. See also ATOMIC WEIGHT. G.L.BU.



Isothermal Lines on a Weather Map of the World. These lines connect places which have the same average temperature in the course of the year. Temperature is measured in degrees. Average temperatures shown range from 0° to 80° F.

ISPAHAN, *IHS pah HAHN*, officially ISFAHAN. See IRAN (Cities).

ISRAEL, *IZ ray el*, is the name of a kingdom founded about 933 B.C. It was made up of the members of ten tribes which broke away from King Rehoboam, the son of Solomon. Israel is sometimes called the Northern Kingdom or the Kingdom of Ephraim. Syria and Judea were constantly attacking it. It was conquered by Assyria, and the capital, Samaria, was destroyed in 722 B.C.

In 1948 a new State of Israel (pop. about 1,250,000) was proclaimed in Palestine with Tel Aviv as capital. Israel immediately plunged into war against the Arabs who opposed the United Nations' plan to divide the country into separate Jewish and Arab states. For the later history of Israel, see PALESTINE (History).

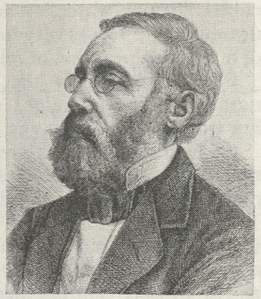
See also ARABIA (colored map); DAVID; GIDEON; JEHU; JEROBOAM; JOSHUA.

ISRAELITE, *IZ rih ehl ite*. See JEW.

ISRAELS, JOZEF (1824-1911), a Dutch painter, is famous for his paintings of everyday life, especially the lives of the poor.

Israels was born in Groningen and studied in Amsterdam and Paris. He began his career as a historical painter. Israels was also known for his etchings. W.ST.

His Works include "The Silent House"; "The Cradle"; and "Toilers of the Sea."



Culver

Jozef Israels, Dutch painter of scenes from ordinary life

ISSUS, *IHS us*, **BATTLE OF.** See ALEXANDER THE GREAT (Conquest of the World).

ISTANBUL, *EE stahn BOOL* (population 1,000,022), is the largest city in Turkey, and one of the oldest cities in the world. For more than 1,600 years Istanbul was called Constantinople, but in 1930 the Turkish Government changed the name of the city. It was the capital of Turkey until 1923, when the seat of government was moved to Ankara.

Istanbul has probably the best location of any city in the world. It is well situated for defense, and it lies at the trade crossroads of Europe and Asia. The land and sea routes that pass through Istanbul have been main streets of history. Invasions, migrations, wars, and conquests have taken place along them. The city is one of the world's most desirable possessions. Its importance to many peoples is shown by the different names by which the city is called. The Persians and Arabs know it as Deri-Seadet. Istanbul is Cošpoli to the Italians and Levantines, Tsarigrad to the Bulgars, and Constantinopolis to the Greeks.

Location and Description. Istanbul is built around the southern end of the Bosporus, the narrow strait that separates Europe from Asia. The Bosporus joins the Black Sea and the Sea of Marmara, and divides Turkey in Asia from Turkey in Europe. Part of Istanbul lies on high ground which can be easily defended. The natural strength of the city's position has been improved by fortifications along the Bosporus. Years ago the Turks also built forts along the shores of the Dardanelles, the narrow channel that leads from the Sea of Marmara to the Aegean Sea.

The railroad which passes through Istanbul is an important land route from southern Europe to western Asia. The sea route through Istanbul is equally important. The only outlet of the Black Sea leads through the Bosporus, the Sea of Marmara, and the Dardanelles, into the Mediterranean.

Istanbul is a city made up of many cities. When the city was first built, it stood on seven hills, as Rome did. The oldest part of Istanbul is called Stamboul. It lies on a triangle of land at the water's edge, and is cut off from the rest of the city by high stone walls and by water.

"Mother and Children" by Jozef Israels has quiet tones and a commonplace subject. This picture is typical of Israels' paintings from the daily lives of poor people. The Dutch artist is noted for his manner of portraying light.

Sawders

Istanbul on the Bosporus in Turkey is one of the most ancient of cities. It is sometimes called the "City of Mosques," because of its many Moslem churches. The great mosque of Sultan Achmed I is at the right. The weather-beaten column in the foreground is the Obelisk of Theodosius. Just behind it is the Hippodrome built by the Emperor Constantine.

Stamboul is bordered on the northeast by the Golden Horn, an inlet of the Bosporus which forms an excellent harbor. To the southeast Stamboul faces the green waters of the Sea of Marmara.

Galata lies across the Golden Horn from Stamboul. It is a suburb originally founded by traders from the Italian city republics. Galata is now chiefly a Greek city. It is the commercial center of Istanbul, and contains most of the banks, stores and office buildings. Galata is connected with Stamboul by two bridges stretched across the Golden Horn.

Pera lies north of Galata. It is the part of Istanbul where most of the foreigners live, and where their schools and consulates are located. Chasköi, the Jewish suburb, is near Pera. A series of small, recently built suburbs stretches northward from Chasköi.

The rest of Istanbul lies across the Bosporus from Stamboul and Galata, so that Istanbul stands on two continents. The chief Asiatic suburb is Scutari, which is officially called Üsküdar. The port of Haydarpasa is south of Scutari, and is the point from which trains are ferried across the Bosporus into the main part of Istanbul. The Turkish government is rapidly developing the harbor at Haydarpasa, so that the port may be the equal of the splendid riverlike harbor formed by the Golden Horn.

Istanbul, or Constantinople, was a backward and unsanitary city for hundreds of years. But an era of modernization began in 1909, when the revolution of the Young Turks dethroned Sultan Abdul-Hamid. A broad granite-paved bridge replaced the ancient link between Stamboul and Galata, and the streets were widened and paved with granite. Istanbul is now a modern city with a good fire-fighting service, an effective water and sewage system, and many up-to-date concrete and steel office buildings and apartment houses. Streetcars have been used in the city since 1913, and telephones and electric lighting were introduced in 1914. Automobiles roll along the wide streets, and trucks carry the loads that once were packed on the backs of strong human burden bearers known as *hamals*.

Culture. In spite of its modernization, Istanbul keeps much of the charm and many of the magnificent buildings from its past. The old part of Istanbul is Turkish in its architecture and atmosphere. Stamboul has great mosques. The mosque of Saint Sophia has been the pride of Islam since the Turkish occupation of Istanbul in 1453. See SAINT SOPHIA.

De Cou, Sawders

Across the Golden Horn from Istanbul is the suburb of Pera with the Tower of Galata rising above it. Pera is the most modern part of the city. The gaily decorated small boats are used to carry both passengers and merchandise.

The high dome and the four minarets of the Mosque of Suleiman stand out among the domes and towers in Istanbul. The mosque was built between 1550 and 1556. Constantine brought the Serpent Column to Constantinople from Delphi during the 300's. The column had stood in Delphi for more than eight hundred years. A great stone tomb, or sarcophagus, in Istanbul came from Smyrna, where it was unearthed many years ago. The tomb is said to have contained the body of Alexander the Great.

The Seraglio is a park which lies high on a hill in Stamboul. The government buildings and palaces of the Ottoman Empire were built in the Seraglio. One of the palaces is now a museum. Other interesting features include the Castle of Seven Towers, which was once a government house of execution, and the old stone walls around Stamboul, which were built at the order of Emperor Theodosius, in the year 447. The Hippodrome, a great stone arena built during the 300's, has been the scene of many public festivals.

Burton Holmes, Ewing Galloway

The Kaiser Drinking Fountain with its domed top is near the great church of Saint Sophia in Istanbul. The tall slender towers in the background are minarets.

Istanbul is the educational and cultural center of Turkey. Many grade and high schools have been opened during the 1900's. Institutions of higher education in Istanbul include the University of Istanbul, the Institute of Education, the Technical University of Istanbul, and the Istanbul School of Economics and Commercial Sciences. There also are two missionary colleges, the American College for Girls and the Robert College, an American institution for men. The Galata Serai, a famous school organized though Turkish and French co-operation, has served as a model for many other Turkish colleges. The city of Istanbul is an important laboratory for students of history and art.

History. Greek legends say that the Argonauts, led by Jason, sailed up the Bosporus past the site of Istanbul when they searched for the Golden Fleece. Long after the time of the legendary Argonauts, Greek adventurers founded a city called Byzantium, in the early 500's B.C. This was the beginning of Istanbul.

In 513 B.C. the Persian king Darius I crossed the Bosporus at the point where Robert College now stands. He conquered the city of Byzantium and controlled it for a brief period. The city was captured in the 300's B.C. by Alexander the Great, King of Macedon, and finally came under the rule of the Roman Empire.

Byzantium was renamed in the A.D. 300's when Emperor Constantine I enlarged the city and made it the capital of his Eastern Empire. Constantine called the capital New Rome, but it came to be known as Constantino-polis, or the *city of Constantine*. After the fall of Rome, Constantinople served as the capital of the Byzantine Empire for almost a thousand years.

The city was frequently attacked by hostile forces. Constantinople was captured by the armies of the Crusaders in 1203 and 1204. It withstood the attacks of the Turks until 1453, when Turkish forces overran Constantinople and brought an end to the Byzantine Empire. The capture of the city sent hundreds of fugitive Greek scholars into Western Europe. The manuscripts and the knowledge that they carried with them helped the revival of ancient learning in Western Europe.

From 1453 until 1922 Constantinople served as the capital of the Turks, first of the Ottoman Empire and later of the Turkish Empire. It was occupied by the Allies from the end of World War I until 1923. Istanbul was a center of activities for the agents of many countries during World War II, because the city and all of Turkey maintained strict neutrality. Istanbul has kept its importance as a trading center and strategically located city, even though it has been replaced as the capital of Turkey by the city of Ankara. R.PEA.

Related Subjects: The reader is also referred to:

Asia (color plate, Mosque in Istanbul)
Bosporus
Byzantine Empire (with list)
Constantine I, the Great
Golden Horn
Jason

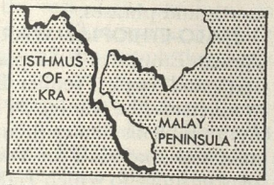
ISTHMIAN, *IHS mih an,* **GAMES.** Ancient Greece had four great national festivals. One of these was known as

the Isthmian games, because it was held on the Isthmus of Corinth. After 582 B.C., the games were held regularly in the spring of the second and fourth years of each Olympiad (the four-year period between the Olympian games). The ancient Greek prizes at the Isthmian games were palm branches and wreaths of parsley. Later, the Romans substituted wreaths of fir as prizes.

These games are thought to have originated in honor of Poseidon (Neptune). A temple to Poseidon once stood in the southern part of the isthmus, where the games were held. The modern town of Isthmia stands on this site. Traces of the old stadium in which the games took place are near by. C.B.W.

See also OLYMPIC GAMES.

ISTHMUS, *IHS mus,* is a narrow strip of land which connects larger bodies of land. These may be two continents or a continent and a peninsula. Isthmuses in many places are a barrier to ship movements. Ship canals sometimes have been dug across them. The Suez Canal, which cuts the isthmus between Africa and Arabia, made the long voyage around Africa unnecessary. The Panama Canal through the Isthmus of Panama has saved ships the dangerous voyage around Cape Horn. Other well-known isthmuses include the Isthmus of Corinth, between southern and northern Greece, and the Isthmus of Kra, which connects the Malay Peninsula and Siam. W.E.E.



A Typical Isthmus, the Isthmus of Kra in Southeastern Asia

See also PANAMA CANAL; SUEZ CANAL.

ISTRIA, *IS trih ah.* This peninsula of northeastern Italy extends into the Adriatic Sea. Istria covers more than 1,500 square miles of mountainous land between the cities of Trieste and Fiume. Olives and grapes are grown in the region. Some shipbuilding and fishing is carried on. The port of Pola lies near the tip of the peninsula. Istria once belonged to Austria, but it was given to Italy by the Treaty of Rapallo in 1920. After World War II, Istria was given to Yugoslavia. See also RAPALLO, TREATIES OF. H.U.S.

ITALIA IRREDENTA, *ee TAH lyah EER rah DEN tah.* See ITALY (Government and History [Modern Kingdom]).

ITALIAN BEE. See BEE (Beekeeping).

ITALIAN CORPORATE STATE. See ITALY (Government and History [Changes in Government]).

ITALIAN EAST AFRICA was created by Italy in 1936. It included Ethiopia, Eritrea, and Italian Somaliland. After Italy was defeated in World War II, Ethiopia regained its independence, and later was federated with Eritrea. Italian Somaliland became a United Nations trust territory under the administration of Italy. See also SOMALILAND.

ITALIAN LANGUAGE. The people of Italy speak a flowing and musical tongue. Their speech follows the written words more closely than does that of many other languages. Italian words almost always end with a vowel, and they contain more vowels than the words of other languages. The vowels and consonants are perfectly balanced. Italian must be spoken by controlling the breath in the same way as in singing. As a result, the language has great variety of pitch. Probably no other language is so easy to sing.

Languages which developed from Latin are called Romance languages, and belong to the Indo-European family of languages. Italian belongs to this group, and today forms the main branch of the Latin language.

After the Roman Empire fell different forms, or dialects, developed in the various localities in Italy. The Tuscan dialect remained closest to the Latin, and finally became the literary language. Many different dialects still are spoken in Italy today. But an educated Italian speaks the literary language, even though he may speak his native dialect as well. W.S.H.

See also ROMANCE LANGUAGE.

ITALIAN LITERATURE. No great writers appeared on Italian soil after the fall of Rome until the latter part of the 1200's. The writing that was done during that time was mostly in Latin. Then Dante chose to write in the Tuscan dialect, and established it as the literary language of Italy. He began to write his *Divine Comedy* about 1307. It is one of the great poems of the world. This was soon followed by Petrarch's noble love poems, *Il Canzoniere,* and the famous tales of fourteenth-century life, the *Decameron* by Boccaccio. Ancient Greek and Roman literature were also rediscovered and studied at this time.

Between 1400 and 1450 many schools and centers of learning sprang up. The best minds sought to uncover the knowledge which had lain buried for centuries in the Greek and Latin manuscripts. Little new literature was produced, but this interest in ancient learning did make knowledge the property of the people. Italian drama then had its beginnings. Some of the noted poetry included *Morgante* by Luigi Pulci (1432-1484), *Orlando Innamorato* by Matteo Maria Boiardo (1430?-1494), and the works of Lorenzo de' Medici and Angelo Poliziano (1454-1494).

The Renaissance. Italian genius came into full flower during the sixteenth century in the great, creative period known as the Renaissance. Machiavelli wrote *The Prince,* and Baldassare Castiglione (1478-1529) produced *The Courtier.* The history of Italy and Florence was written by Francesco Guicciardini (1483-1540).

Outstanding poets were Lodovico Ariosto (1474-1533), author of *Orlando Furioso,* and Torquato Tasso, who wrote the great Christian epic, *Jerusalem Delivered.* A type of comic drama, called *commedia dell' arte,* appeared. Instructive, or didactic, poetry and satirical poetry both flourished. Such poets as Giambattista Marino (1569-1625) and Gabriello Chiabrera (1552-1637) produced works of only minor importance. But they prepared the way for melodrama and opera.

Eighteenth and Nineteenth Centuries. Pietro Metastasio (1698-1782) brought Italian melodrama to its highest point and Carlo Goldoni (1707-1793) contributed to the development of the modern theater. The poems of Guiseppe Parini (1729-1799) had a social aim.

The strong national feeling gave a political tone to the plays of Vittorio Alfieri (1749-1803) and the poems of Ugo Foscolo (1778-1827).

The nineteenth century produced Giacomo Leopardi (1798-1837), perhaps the greatest lyric poet after Dante,

Sixteenth Century Lettera Bastarda By Lucas (Spanish)

SIXTEENTH CENTVRY CAPITALS BY SACCHI (ITALIAN)

These Old Italic Type Faces were made more than 400 years ago. The names of the men who designed them appear in the illustration. Type of this kind was first used in 1501 to print an edition of the works of the Roman poet, Virgil.

and Alessandro Manzoni (1785-1873), a great Italian novelist. Outstanding works also appeared in the fields of history, philosophy, and politics. Francesco de Sanctis (1817-1883) wrote a masterpiece of literary criticism. Prominent poets included Giosuè Carducci (1835-1907) and Giovanni Pascoli (1855-1912).

The novels of Antonio Fogazzaro (1842?-1911) studied the conflict between faith and knowledge. Giovanni Verga (1840-1922) wrote plays and novels, one of which, *Cavalleria Rusticana*, became the basis of the famous opera.

Twentieth Century. One of the most outstanding Italian literary figures of recent times was Gabriele d'Annunzio (1863-1938). He achieved fame as a poet, a dramatist, and a novelist. Another prominent name is that of Luigi Pirandello (1867-1936), author of novels, plays, and short stories. He won the Nobel prize in 1934.

Benedetto Croce (1866-) attained wide influence through his writings on philosophy. The novelist and short-story writer, Grazia Deledda (1875-1936) won the Nobel prize in 1926. Many works of merit have been produced by other writers who are less well known. Several Italians have made important contributions in the field of history. W.S.H.

Related Subjects. The reader is also referred to:

Alfieri, Vittorio, Count	Petrarch
Annunzio, Gabriele d', Prince	Pirandello, Luigi
Boccaccio, Giovanni	Romance Language
Dante	Tasso, Torquato

ITALIAN SOMALILAND is a region which extends along the east coast of Africa from British Somaliland to Dicks Head, in Kenya Colony. The region covers an area of about 194,000 square miles. It is more than two thirds the size of the state of Texas. It has a population of 972,000. There are about 4,000 Italians. The capital is Mogadiscio. (See MOGADISCIO; EGYPT [colored map].) Most of the people work at stock raising or agriculture. The chief products include animal hides, cotton and cottonseed oil, sesame oil, butter, resin, ivory, and kapok.

Italian Somaliland was made a state of the government of Italian East Africa in 1936. During World War II, British troops conquered the region. They occupied it from 1941 to 1950. Then Italian Somaliland became a United Nations trust territory under Italian rule. The Somalis were given ten years to prepare for their independence. R.PEA.

ITALICS, *ih TAL iks, is the style of type in which these words are printed.* It was first used in Venice, and is said to be an imitation of Petrarch's handwriting. The capitals were originally roman in form. One of Virgil's works was the first book printed in this type. Between 1501 and 1558, six or seven different editions of this work were printed. The use of italic type spread to France, Germany, and England. Finally, it was used only for introductions, prefaces, notes, indexes, and quotations. The body of a text using italic type is usually printed in roman type. Italics are now used to indicate special emphasis, or to set off specific phrases and words, including names of books, plays, and ships, and foreign words and phrases. S.M.S.

ITALO-ETHIOPIAN WAR. Italy waged war against the African Empire of Ethiopia (formerly Abyssinia) during 1935 and 1936. Premier Benito Mussolini started the war because he wanted to turn the attention of Italians from problems facing them at home. He also hoped to gain raw materials for Italian industry and to obtain new territory to which Italians could emigrate.

The invasion began in October, 1935. In the north the Italians attacked from Eritrea and captured Adowa and Adigrat on October 6. Aksum fell five days later. On November 8, Makale was taken. In the south the Italians soon captured Gherlogubi and Gorahai.

Italian bombs quickly made ruins of the flimsy houses in Ethiopian towns, and Emperor Haile Selassie became convinced that it was hopeless to continue the war against an enemy equipped with modern military weapons. He fled from the country, and on May 5, 1936, the Italians under Marshal Pietro Badoglio took possession of Addis Ababa, the capital. In Rome, Premier Mussolini announced the end of the war and proclaimed Ethiopia Italian territory, with the King of Italy as Emperor.

Italy acted against the principles of the League of Nations in this war. The League tried to stop the war by cutting off much of Italy's trade. But the Italians won the war before these economic sanctions could take effect.

See also ETHIOPIA (Conquest by Italy). J.S.S.

International News

Soldiers of the Regular Ethiopian Army in an engagement near the town of Harar during the Italo-Ethiopian War

Gendreau; H. Arn strong Roberts

ITALY occupies a peninsula which is set off from the rest of Europe by the high Alps Mountains. It is almost as sharply separated from the rest of the continent as the islands of Great Britain are. The ancient Romans called the peninsula *Italia*, and the people kept this name for their country when it was organized in 1861.

Italy has played an important part in every great period of Europe's history. In Roman days, Italy was the center of the Western world. Its culture influenced Europe, North Africa, and the Near East. Italy led Europe out of the Dark Ages. The Renaissance had its birth and its most glorious height in northern Italy. Thousands of students and tourists are drawn to Italy by its historic buildings, its painting and sculpture, and the beauty of the landscape.

Italians need not go back to ancient Rome, or even to the Renaissance, in order to claim greatness for their country. Any country would be proud of a statesman like Giuseppe Mazzini or Count Camillo Benso di Cavour, a physicist like Marchese Guglielmo Marconi, or a poet and playwright like Prince Gabriele d'Annunzio.

The Land and Its Resources

Extent: *Area*, 116,235 square miles; *greatest length*, 708 miles; *greatest width*, 120 miles. *Coast line*, 2,681 miles.

Physical Features: *Chief mountain ranges*, Alps, Apennines. *Chief peaks*, Mont Blanc on French border, 15,781 feet; Mount Etna, 10,740 feet. *Elevation*, highest, Mont Blanc, 15,781 feet; lowest, sea level. *Chief rivers*, Adige, Arno, Po, and Tiber. *Chief lakes*, Como, Garda, Lugano, Maggiore. *Chief islands*, Sardinia, Sicily.

Location, Size, and Surface Features. Italy is not quite so large as the state of New Mexico. The boot-shaped peninsula, with the island of Sicily at the toe of the boot, forms a bridge across the center of the Mediterranean Sea from Europe almost to Africa. No place in the "leg" of the boot is more than 60 miles from the sea. Much of the shore is low, but some of it is mountainous. Spezia, Naples, and the great port of Genoa are the best harbors on the west coast. On the east are the harbors of Ancona, Bari, Brindisi, and Venice. For the boundaries of Italy, see the colored map.

There are three important highland areas in Italy. The great Alps encircle the peninsula on the north. The Apennine Mountains curve from the "knee" to the "toe" of the boot. The third highland is the great plateau which makes up the interior of the island of Sicily.

There are three active volcanoes in Italy. Mount Vesuvius, south of Naples, is the most famous. It is 4,267 feet high, and has had fifty serious eruptions in historic times. In A.D. 79 the Roman cities of Pompeii and Herculaneum were buried in lava from Vesuvius. Mount Etna, the highest of Italy's volcanic peaks, is on the eastern coast of Sicily. Its eruptions have destroyed many villages. Mount Stromboli (3,040 feet) is on the island of Stromboli halfway between Etna and Vesuvius. The earth forces that produce Italy's volcanoes also cause earthquakes, and Italy has more earthquakes than any other country in the world except Japan.

Rivers and Lakes. The chief rivers of Italy are the Po, the Adige, the Arno, and the Tiber. Small streams from the Alps flow south to form the Po River. When the

Location Map of Italy

Alpine snows melt in springtime, they often cause severe floods. Since the time of Leonardo da Vinci, Italian engineers have built dikes against these floods. The Po and its tributaries furnish some water power, but their greatest value is that their waters irrigate the rich Po Valley. The Po flows eastward into the Adriatic Sea.

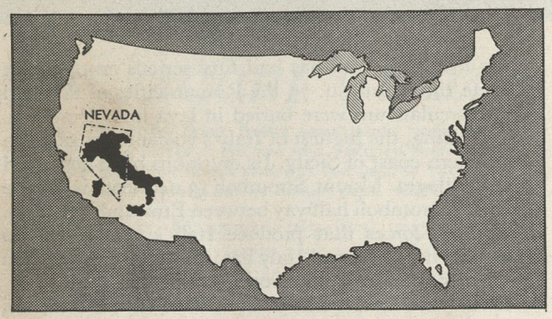
The Adige, second largest river of Italy, begins in the Tyrolean mountains. It flows south through Lake Garda to the plains of northern Italy. There it turns east and flows parallel to the Po. The two rivers form a common delta. The Arno is the important river of the region around Florence. The Tiber flows through Rome. Both the Arno and the Tiber flow westward into the Tyrrhenian Sea.

Northern Italy is known for its beautiful lakes. The mountain glaciers which deepened the valleys of the Alps left great ridges of earth which dammed off the

lower ends of the valleys. Lovely lakes have filled up these spaces. Among these famous lakes are Como, Lugano, Maggiore, and Garda. Italy also has a number of circular lakes which have filled up old volcanic craters.

Natural Regions. Italy has five clearly marked natural regions: the southern slopes of the Alps, the Po Valley, the Apennines region, the Campagna, and the plain at the north end of the Adriatic Sea.

The Alpine Slope. Much of the land along the Alps is too steep for use except as forests and goat pastures. But every possible slope is terraced to support vines, and even mulberry trees for feeding silkworms. A forest



Italy (in Black) Compared in Size with the United States

region lies above the terraced zone and the Alps meadows are above the forests. Waterfalls of this region furnish power to the manufacturing cities of the Po Valley.

The Po Valley is the most important region of Italy. It has the greatest number of people, the greatest density of population, the most cities, the best railway and road systems, the most agriculture, and the most industry. Most of the valley is fertile, though in some places there are gravels washed down from the mountains. This region has rainy winters and dry summers. The melting snows of the Alps furnish water which is distributed through great canals during the summer months. This region is sometimes called the *Lombardy Plains.*

The Adriatic Plain. The plain at the north end of the Adriatic Sea forms a small, separate region. The eastern half of the plain is known as the *Carso Plateau.* It is a limestone area, and not good for farming. Much of the water of this region flows off in underground rivers.

The Apennines form a separate natural region. In the north they are high and rugged. Olive trees and mountain forests are abundant. The central portion is lower and furnishes good grazing grounds. In the south, the Apennine area has little value, and the plain on the east coast is narrow and unimportant. But the west coast of the Apennine region is second in importance only to the Po Valley. A broad plain lies in the arc of the Apennines from Spezia to the south of Naples. The northern half forms the hill and plain country known as Tuscany. Olive groves flourish, and there is good farm land. This region also contains Italy's supply of iron ore. The southern half of the arc is called the *Campagna.* Much of this region is a low coastal plain. It includes the famous Pontine marshes. The Campagna stretches from Rome to Naples. Most of the cities and villages lie above the plain in the foothills of the Apennines. The productive farming area of Benevento is behind Naples, on fertile volcanic soil.

Climate. "Sunny Italy" is a fitting name for most of the Italian peninsula. Many people think of Italy as a southern land because of its mild climate, but it actually lies in the same latitude as the American coast from Maine to Delaware. The northern border, along the high Alps, is chilly in winter and has a heavy snowfall. There is plenty of rain throughout most of Italy, but it comes in the fall and winter months, so that it is not useful for agriculture.

Natural Resources. Unlike most mountain countries, Italy has very little mineral wealth. The most important mineral deposits include Carrara marble, sulfur, and bauxite. There is a little iron ore in Tuscany and Piedmont, and on the islands of Elba and Sardinia. Sardinia also has copper, zinc, lead, silver, and mercury. But there is almost no coal in the country. There is a little mercury on the peninsula.

In some parts of Italy the soil is unusually rich. The Po Valley region has some of the finest farm land in the world. But the difficulties of irrigation in some regions make it impossible for Italians to get the full use of this natural resource.

The People and Their Work

Population: estimated, 46,272,000; *density*, about 398 persons per square mile; *distribution*, urban, about 52 per cent; rural, about 48 per cent.

Chief Products: *Agricultural*, fruits, especially grapes used in wine making, olives, oranges, lemons, figs, dates; grains, especially wheat, corn, barley, oats; vegetables, especially sugar beets; mulberry leaves to feed silkworms. *Dairy*, especially cheese. *Mineral*, Carrara marble, sulfur, bauxite used in making aluminum. *Manufactured*, silk, woolen, and cotton materials; jewelry, pottery, carved ivory and marble, straw hats, olive oil, sugar refined from sugar beets.

The People. Most Italians are descended from people who have lived in Italy for a long time. Many of them are short, with olive skins and dark eyes. But there is no such thing as an "Italian race," for many peoples have poured over the Alps into the basin of the Po Valley. Tribes from Northern Europe came to live there in the

Ewing Galloway

Wine Bottles Covered with Straw Jackets fill the hand-cart of this delivery man in the great seaport of Genoa.

ITALY

Population 46,272,000

Cities

(Populations are for Communes)

Abbiategrasso, 18,192 . . B 2
Acireale, 40,012 . . . . . F 5
Acqui, 15,900 . . . . . B 2
Adrano, 27,542 . . . . . F 5
Adria, 34,126 . . . . . B 4
Agira, 16,521 . . . . . F 5
Agnone, 9,888 . . . . . D 5
Agrigento, 39,702 . . . . . F 4
Agropoli, 7,470 . . . . . D 5
Alassio, 8,544 . . . . . C 2
Alba, 14,994 . . . . . B 2
Albano Laziale, 13,216 . . . . . D 4, h 9
Albenga, 11,455 . . . . . B 2
Alcamo, 42,468 . . . . . F 4
Alessandria, 86,678 . . . . B 2
Alghero, 19,879 . . . . . D 2
Altamura, 36,974 . . . . . D 6
Amantea, 10,689 . . . . . E 6
Amendolara, 3,297 . . . . . E 6
Ancona, 87,239 . . . . . C 4
Andria, 64,111 . . . . . D 6
Anguillara, 2,774 . . . . . g 8
Anzio, 8,493 . . . . . D 4, k 9
Aosta, 25,976 . . . . . B 1
Aprilia . . . . . D 4, h 9
Arborea, 2,681 . . . . . E 2
Ardea, 438 . . . . . h 9
Arezzo, 67,313 . . . . . C 3
Argenta, 28,578 . . . . . B 3
Ariano Irpino, 28,482 . . D 5
Artena, 7,707 . . . . . h 9
Ascoli Piceno, 45,259 . . . C 4
Assisi, 24,439 . . . . . C 4
Asti, 53,147 . . . . . B 2
Augusta, 23,794 . . . . . F 5
Avellino, 37,401 . . . . . D 5
Aversa, 26,043 . . . . . D 5
Avezzano, 23,267 . . . . . C 4
Avigliano, 14,343 . . . . . D 5
Avola, 24,907 . . . . . F 5
Bagheria, 30,567 . . . . . E 4
Bagnara, 14,603 . . . . . E 5
Barcellona, 32,218 . . . . . E 5
Bari, 268,734 . . . . . D 6
Barletta, 63,370 . . . . . D 6
Bassano del Grappa, 26,449 . . . . . B 3
Baunei, 3,679 . . . . . D 2
Belluno, 28,288 . . . . . A 4
Belvedere Marittimo, 9,069 . . . . . E 5
Benevento, 50,156 . . . . . D 5
Bergamo, 106,450 . . . . . B 2
Bianco, 5,057 . . . . . E 6
Biella, 41,546 . . . . . B 2
Bisceglie, 37,506 . . . . . D 6
Bitonto, 34,393 . . . . . D 6
Boccea (Buxus) . . . . . h 8
Bologna, 342,239 . . . . . B 3
Bolzano, 77,978 . . . . . A 3
Bonorva, 7,688 . . . . . D 2
Bordighera, 8,621 . . . . . C 1
Borgomanero, 14,728 . . B 2
Borgo Piave . . . . . k 9
Borgo Val di Taro, 11,809 . . . . . B 2
Bosa, 7,688 . . . . . D 2
Bra, 18,109 . . . . . B 1
Bracciano, 6,783 . . . . . g 8
Brescia, 150,635 . . . . . B 3
Bressanone, 10,512 . . . . A 3
Brindisi, 61,443 . . . . . D 6
Budrio, 16,364 . . . . . B 3
Busto Arsizio, 50,325 . . B 2
Cagli, 13,618 . . . . . C 4
Cagliari, 136,655 . . . . . E 2
Caltagirone, 42,821 . . . . F 5
Caltanissetta, 56,905 . . . F 5
Camerino, 12,784 . . . . . C 4
Campiglia Marittima, 13,470 . . . . . C 3
Campobasso, 29,677 . . . D 5
Canicatti, 31,984 . . . . . F 4
Canosa, 33,153 . . . . . D 6
Capanne . . . . . h 8
Capannori, 42,569 . . . . . C 3
Capua, 15,427 . . . . . D 5
Carbonia, 43,808 . . . . . E 2
Cariati, 5,204 . . . . . E 6
Carini, 16,304 . . . . . E 4
Carloforte, 7,478 . . . . . E 2
Carmagnola, 13,427 . . . . B 1
Carpi, 36,172 . . . . . B 3
Carrara, 62,796 . . . . . B 3
Casale Monferrato, 36,264 . . . . . B 2
Casalmaggiore, 15,498 . B 3
Casape, 1,241 . . . . . h 9
Casarano, 13,440 . . . . . D 7
Case Carano . . . . . h 9
Caserta, 44,081 . . . . . D 5
Cassino, 21,275 . . . . . D 4
Castel di Guido . . . . . h 8
Castel di Leva . . . . . h 9
Castel Giuliano . . . . . g 8
Castel Madama, 4,291 . . h 9
Castelvetrano, 29,691 . . F 4
Castrovillari, 13,464 . . . . E 6
Catania, 291,855 . . . . . F 5
Catanzaro, 59,737 . . . . . E 6
Cattolica, 7,908 . . . . . C 4
Cavarzere, 28,402 . . . . . B 4
Cave, 5,856 . . . . . h 9
Cecchignola . . . . . h 9
Cecina, 11,931 . . . . . C 3
Cefalù, 11,897 . . . . . E 5
Ceglie Messapico, 23,075 . . . . . D 6
Cerignola, 48,124 . . . . . D 5
Cerveteri, 3,759 . . . . . g 8
Cesena, 70,240 . . . . . B 4
Cesenatico, 12,665 . . . . . B 4
Cetraro, 9,366 . . . . . E 5
Chiari, 15,391 . . . . . B 2
Chiavari, 19,785 . . . . . B 2
Chieri, 14,246 . . . . . B 1
Chieti, 39,707 . . . . . C 5
Chioggia, 47,859 . . . . . B 4
Chiusi, 8,498 . . . . . C 3
Chivasso, 11,600 . . . . . B 1
Cisterna di Latina, 14,859 . . . . . h 9
Cittadella, 14,171 . . . . . B 3
Città di Castello, 36,341 . . . . . C 4
Cividale del Friuli, 11,608 . . . . . A 4
Civitanova Marche, 20,208 . . . . . C 4
Civitavecchia, 38,645 . . . C 3
Codogno, 12,100 . . . . . B 2
Colonna, 1,695 . . . . . h 9
Comacchio, 14,766 . . . . . B 4
Comiso, 25,827 . . . . . F 5
Como, 76,810 . . . . . B 2
Conegliano, 17,710 . . . . B 4
Copparo, 25,005 . . . . . B 3
Corato, 46,540 . . . . . D 6
Cori, 9,681 . . . . . h 9
Corigliano, 19,889 . . . . . E 6
Corleone, 16,692 . . . . . F 4
Cortona, 32,763 . . . . . C 3
Cosenza, 61,657 . . . . . E 6
Crema, 27,021 . . . . . B 2
Cremona, 71,796 . . . . . B 3
Cretone, 374 . . . . . g 9
Crotone, 28,465 . . . . . E 6
Cuglieri, 4,942 . . . . . D 2
Cuneo, 43,216 . . . . . B 1
Domodossola, 12,106 . . . A 2
Dorgali, 6,353 . . . . . D 2
Eboli, 18,944 . . . . . D 5
Empoli, 28,568 . . . . . C 3
Enna, 27,198 . . . . . F 5
Erice, 33,610 . . . . . E 4
Este, 16,660 . . . . . B 3
Fabriano, 28,836 . . . . . C 4
Faenza, 46,612 . . . . . B 3
Fano, 35,949 . . . . . C 4
Fasano, 25,529 . . . . . D 6
Favara, 24,944 . . . . . F 4
Feltre, 20,364 . . . . . A 3
Ferentino, 16,836 . . . . . D 4
Fermo, 27,255 . . . . . C 4
Ferrara, 137,203 . . . . . B 3
Fertilia . . . . . D 2
Fidenza, 17,903 . . . . . B 3
Firenze (Florence), 382,083 . . . . . C 3
Firenzuola, 11,070 . . . . . B 3
Fiumicino, 1,121 . . . . . h 8
Foggia, 89,955 . . . . . D 5
Fogliano . . . . . k 9
Foligno, 44,605 . . . . . C 4
Follonica, 7,147 . . . . . C 3
Fondi, 18,951 . . . . . D 4
Forlì, 75,778 . . . . . B 4
Formello, 1,618 . . . . . g 8
Fossano, 20,573 . . . . . B 1
Fossombrone, 11,315 . . . C 4
Francavilla Fontana, 26.626 . . . . . D 6
Frascati, 13,414 . . . D 4, h 9
Fregene . . . . . h 8
Frosinone, 22,248 . . . . . D 4
Gaeta, 16,454 . . . . . D 4
Gagliano del Capo, 3,869 . . . . . E 7
Galatina, 23,195 . . . . . D 7
Gallarate, 27,900 . . . . . B 2
Gallicano nel Lazio, 2,024 . . . . . h 9
Gallipoli, 15,265 . . . . . D 6
Gela, 41,284 . . . . . F 5
Genova (Genoa), 673,162 . . . . . B 2
Genzano di Roma, 10,404 . . . . . h 9
Ginosa, 15,613 . . . . . D 6
Gioia del Colle, 27,094 . . . . . D 6
Gioiosa Ionica, 16,580 . . E 6
Giulianova, 12,610 . . . . . C 4
Glorenza, 768 . . . . . A 3
Gorizia, 45,352 . . . . . B 4
Grammichele, 14,948 . . . F 5
Gravina, 28,582 . . . . . D 6
Grosseto, 37,772 . . . . . C 3
Grottaferrata, 5,377 . . . . h 9
Grottaglie, 20,159 . . . . . D 6
Guastalla, 14,328 . . . . . B 3
Gubbio, 37,658 . . . . . C 4
Guidonia, 10,391 . . D 4, h 9
Iesi, 31,876 . . . . . C 4
Iglesias, 26,976 . . . . . E 2
Imola, 42,955 . . . . . B 3
Imperia, 30,710 . . . . . C 2
Isernia, 11,455 . . . . . D 5
Isola Capo Rizzuto, 5,987 . . . . . E 6
Istonio, 21,523 . . . . . C 5
Ivrea, 17,163 . . . . . B 1
Ladispoli, 464 . . . . . h 8
La Maddalena, 11,062 . . D 2
Lanciano, 26,638 . . . . . C 5
Lanusei, 4,806 . . . . . E 2
Lanuvio, 3,486 . . . . . h 9
L'Aquila, 56,052 . . . . . C 4
Larino, 8,678 . . . . . D 5
La Spezia, 124,121 . . . . B 2
Latina, 34,155 . . . . D 4, k 9
Lauria Inferiore, 12,089 D 5
Lavello, 13,869 . . . . . D 5
Lecce, 61,979 . . . . . D 7
Lecco, 40,805 . . . . . B 2
Le Ferriere . . . . . h 9
Legnano, 35,037 . . . . . B 2
Leonforte, 17,699 . . . . . F 5
Lercara Friddi, 13,282 . . F 4
Licata, 35,871 . . . . . F 4
Licenza, 1,588 . . . . . g 9
Lido di Roma . . . . . h 8
Lipari, 13,733 . . . . . E 5
Littoria, see Latina
Livorno (Leghorn), 146,322 . . . . . C 3
Loreto, 7,908 . . . . . C 4
Lucca, 89,055 . . . . . C 3
Lucera, 22,901 . . . . . D 5
Lugo, 30,458 . . . . . B 3
Maccarese . . . . . h 8
Macerata, 31,089 . . . . . C 4
Madonna di Bracciano . . g 8
Magenta, 15,294 . . . . . B 2
Maglie, 12,616 . . . . . D 7
Malagrotta . . . . . h 8
Manduria, 23,454 . . . . . D 6
Manfredonia, 29,160 . . . D 5
Mantova (Mantua), 57,744 . . . . . B 3
Manziana, 2,229 . . . . . g 8
Marino, 15,556 . . . . . h 9
Marsala, 71,809 . . . . . F 4
Martina, 35,250 . . . . . D 6
Massa, 47,867 . . . . . B 3
Massafra, 16,198 . . . . . D 6
Massa Marittima, 16,205 . . . . . C 3
Matera, 29,600 . . . . . D 6
Mazara del Vallo, 31,794 . . . . . F 4
Mazzarino, 19,400 . . . . . F 5
Melfi, 17,947 . . . . . D 5
Melito Porto Salvo, 8,880 . . . . . F 5
Menfi, 11,732 . . . . . F 4
Mentana, 5,489 . . . . . g 9
Merano, 24,907 . . . . . A 3
Mesagne, 22,313 . . . . . D 6
Messina, 226,860 . . . . . E 5
Mestre . . . . . B 4
Metaponto, 445 . . . . . D 6
Milano (Milan), 1,286,812 . . . . . B 2
Milazzo, 22,296 . . . . . E 5
Minervino Murge, 20,501 . . . . . D 6
Minturno, 14,731 . . . . . D 4
Mistretta, 12,129 . . . . . F 5
Modena, 116,224 . . . . . B 3
Modica, 41,256 . . . . . F 5
Mola di Bari, 23,490 . . . D 6
Molfetta, 55,767 . . . . . D 6
Moliterno, 5,657 . . . . . D 5
Mondovì, 20,439 . . . . . B 1
Monfalcone, 22,735 . . . B 4
Monopoli, 34,148 . . . . . D 6
Monreale, 20,623 . . . . . E 4
Montecelio . . . . . g 9
Monte Mario . . . . . h 8
Monte Porzio Catone, 3,203 . . . . . h 9
Montepulciano, 17,552 . C 3
Monterotondo, 9,340 . . . g 9
Monte Sant' Angelo, 26,917 . . . . . D 5
Montevarchi, 16,469 . . . C 3
Monza, 70,492 . . . . . B 2
Mortara, 12,731 . . . . . B 2
Muravera, 4,417 . . . . . E 2
Napoli (Naples), 1,021,023 . . . . . D 5
Nardo, 24,537 . . . . . D 7
Nettuno, 12,084 . . . . . k 9
Nicastro, 30,920 . . . . . E 6
Nicosia, 19,490 . . . . . F 5
Nicotera, 9,143 . . . . . E 5
Nola, 23,123 . . . . . D 5
Noto, 33,766 . . . . . F 5
Novara, 72,569 . . . . . B 2
Novi Ligure, 21,742 . . . . B 2
Nuoro, 15,910 . . . . . D 2
Olbia, 15,276 . . . . . D 2
Orbetello, 14,943 . . . . . C 3
Oristano, 16,773 . . . . . E 2
Ortona a Mare, 22,151 . . C 5
Orvieto, 23,880 . . . . . C 4
Ost . . . . . g 8
Ostia Antica . . . . . h 8
Ostuni, 30,558 . . . . . D 6
Otranto, 3,340 . . . . . D 7
Ottavia . . . . . h 8
Ovada, 9,594 . . . . . B 2
Ozieri, 12,012 . . . . . D 2
Padova (Padua), 168,311 . . . . . B 3
Palazzolo Acreide, 13,147 . . . . . F 5
Palermo, 491,357 . . . . . E 4
Palestrina, 9,154 . . . . . h 9
Palidoro (Baebiana), 2,169 . . . . . h 8
Palmi, 21,025 . . . . . E 5
Palo (Alsium), 363 . . . . . h 8
Palombara Sabina, 6,215 . . . . . g 9
Pantelleria, 10,730 . . . . F 3
Paola, 14,381 . . . . . E 6
Parma, 122,883 . . . . . B 3
Partinico, 25,311 . . . . . E 4
Paterno, 35,782 . . . . . F 5
Pavia, 66,516 . . . . . B 2
Penne, 14,267 . . . . . C 4
Pergine Valsugana, 10,228 . . . . . A 3
Perugia, 95,034 . . . . . C 4
Pesaro, 53,064 . . . . . C 4
Pescara, 66,667 . . . . . C 5
Pescia, 21,823 . . . . . C 3
Petilia Policastro, 11,531 . . . . . E 6
Piacenza, 80,927 . . . . . B 2
Piazza Armerina, 27,637 . . . . . F 5
Pieve di Cadore, 3,631 . . . . . A 4
Pinerolo, 24,636 . . . . . B 1
Piombino, 30,855 . . . . . C 3
Pisa, 84,556 . . . . . C 3
Pisciotta, 4,025 . . . . . D 5
Pisticci, 14,273 . . . . . D 6
Pistoia, 75,915 . . . . . C 3
Pizzo, 9,465 . . . . . E 6
Poggibonsi, 14,119 . . . . . C 3
Pomezia, 4,488 . . . . . h 9
Pontedera, 19,508 . . . . . C 3
Pontremoli, 16,192 . . . . B 2
Pordenone, 25,588 . . . . . B 4
Portoferraio, 12,015 . . . . C 3
Portogruaro, 22,231 . . . . B 4
Portomaggiore, 26,214 . B 3
Portoscuso, 2,262 . . . . . E 2
Portotorres, 9,166 . . . . . D 2
Potenza, 33,269 . . . . . D 5
Pozzallo, 11,926 . . . . . F 5
Pozzuoli, 38,770 . . . . . D 5
Prato, 77,155 . . . . . C 3
Prizzi, 10,816 . . . . . F 4
Pula, 2,477 . . . . . E 2
Quartiere Monte Sacro . . . . . h 9
Quartu Sant' Elena, 15,605 . . . . . E 2
Ragusa, 54,015 . . . . . F 5
Rapallo, 14,037 . . . . . B 2
Ravenna, 88,358 . . . . . B 4
Recanati, 17,730 . . . . . C 4
Reggio Calabria, 141,854 . . . . . E 5
Reggio Emilia, 106,289 . B 3
Ribera, 16,987 . . . . . F 4
Rieti, 33,269 . . . . . C 4
Rimini, 74,606 . . . . . B 4
Rionero in Vulture, 14,054 . . . . . D 5
Riva, 11,041 . . . . . B 3
Rocca Massima, 1,961 . . h 9
Roccastrada, 14,724 . . . . C 3
Rome (Roma), 1,649,684 . . . . D 4, h 8
Ronciglione, 7,079 . . . . . C 4
Rossano, 19,593 . . . . . E 6
Rotondella, 5,643 . . . . . D 6
Rovato, 11,377 . . . . . B 2
Rovereto, 22,098 . . . . . B 3
Rovigo, 45,692 . . . . . B 3
Ruvo, 26,880 . . . . . D 6
Sabaudia, 6,262 . . . . . D 4
Sacrofano, 1,576 . . . . . g 8
Sala Consilina, 10,994 . . D 5
Salemi, 18,378 . . . . . F 4
Salerno, 91,665 . . . . . D 5
Salsomaggiore, 16,789 . . . . . B 2
Saluzzo, 16,789 . . . . . B 1
San Bartolomeo, 10,673 . . . . . D 5
San Benedetto del Tronto, 21,835 . . . . . C 4
San Cataldo, 23,828 . . . . F 4
San Donà di Piave, 25,928 . . . . . B 4
San Giovanni in Fiore, 16,817 . . . . . E 6
San Marco, 21,583 . . . . . D 5
San Paolo . . . . . h 8
San Remo, 37,195 . . . . . C 1
San Sebastiano . . . . . h 9
San Sepolcro, 12,432 . . . C 4
San Severo, 45,819 . . . . D 5
Santa Maria, 26,142 . . . D 5
Sant' Angelo Romano, 1,811 . . . . . g 9
Santa Teresa di Gallura, 2,570 . . . . . D 2
San Vito al Tagliamento, 12,337 . . . . . B 4
Sapri, 6,188 . . . . . D 5
Saronno, 29,189 . . . . . B 2
Sarzana, 15,389 . . . . . B 2
Sassari, 70,188 . . . . . D 2
Savigliano, 18,951 . . . . B 1
Savona, 72,428 . . . . . B 2
Scansano, 8,560 . . . . . C 3
Scanzano, 683 . . . . . D 6
Scauri . . . . . F 3
Schio, 24,734 . . . . . B 3
Sciacca, 27,343 . . . . . F 4
Senigallia, 31,554 . . . . . C 4
Sesto, 18,552 . . . . . C 3
Sestri Levante, 16,397 . . B 2
Sezze, 17,448 . . . . . D 4
Siderno Marina, 16,430 . . . . . E 6
Siena, 53,237 . . . . . C 3
Silandro, 3,958 . . . . . A 3
Siniscola, 5,432 . . . . . D 2
Siracusa, 70,432 . . . . . F 5
Sondrio, 14,559 . . . . . A 2
Sora, 24,455 . . . . . D 4
Soresina, 11,164 . . . . . B 2
Sorrento, 10,851 . . . . . D 5
Soverato, 4,750 . . . . . E 6
Spinazzola, 12,962 . . . . D 6
Spoleto, 36,543 . . . . . C 4
Sulmona, 23,729 . . . . . C 4
Susa, 5,891 . . . . . B 1
Tanaunella, 208 . . . . . D 2
Taormina, 6,521 . . . . . F 5
Taranto, 192,770 . . . . . D 6
Tarquinia, 9,776 . . . . . C 3
Taurianova, 19,677 . . . . E 6
Tempio Pausania, 16,680 . . . . . D 2

ITALY
1 Inch = 63 Statute Miles
Miles 25 0 25 50
National Capital
Size of symbols and type indicates relative population
Conic Projection
RELIEF
Feet
5 000
2 000
1 000
500
Sea Level
Below Sea Level
500
5 000
Tyrrhenian Sea
Adriatic Sea
Ligurian Sea
Mediterranean Sea
Gulf of Venice
Gulf of Trieste
Gulf of Genoa
Gulf of Naples
Gulf of Salerno
Gulf of Taranto
Gulf of Tunis
Gulf of Sirte
Strait of Messina
Strait of Bonifacio
Galite Channel
Mouths of the Po
Rome (Roma)
Vatican City
Milano (Milan)
Napoli (Naples)
Venezia (Venice)
Genova (Genova)
Torino (Turin)
Palermo
Trieste
Bologna
Firenze (Florence)
Bari
Taranto
Messina
Catania
Tunis
Cagliari
Bizerte
Longitude East of Greenwich
COSMO RELIEF ITALY
Copyright by RAND McNALLY & CO. Made in U.S.A.
Prepared expressly for THE WORLD BOOK ENCYCLOPEDIA

Teramo, 38,407 ..... C 4
Termini Imerese, 24,526 ..... F 4
Termoli, 9,686 ..... C 5
Terni, 81,850 ..... C 4
Terracina, 26,107 ..... D 4
Teulada, 5,161 ..... E 2
Tirano, 7,517 ..... A 3
Tivoli, 23,581 ..... D 4, h 9
Todi, 21,590 ..... C 4
Tolmezzo, 7,749 ..... A 4
Torino (Turin), 726,618 ..... B 1
Torre Annunziata, 49,864 ..... D 5
Torre de Greco, 61,001 ..... D 5
Torremaggiore, 17,687 ..... D 5
Torre Nova ..... h 9
Tortona, 21,931 ..... B 2
Trani, 35,462 ..... D 6
Trapani, 75,357 ..... E 4
Trento, 64,171 ..... A 3
Treviglio, 21,308 ..... B 2
Treviso, 66,622 ..... B 4
Trino, 10,053 ..... B 2
Tropea, 6,904 ..... E 5
Udine, 80,225 ..... A 4
Urbino, 23,539 ..... C 4
Vaccina ..... h 8
Vallo della Lucania, 6,863 ..... D 5
Valmontone, 7,314 ..... h 9
Varazze, 12,134 ..... B 2
Varese, 59,122 ..... B 2
Vatican City, 890 ..... D 4, h 8
Velletri, 34,548 ..... D 4, h 9
Venezia (Venice), 318,538 ..... B 4
Ventimiglia, 14,156 ..... C 1
Vercelli, 44,201 ..... B 2
Verona, 197,451 ..... B 3
Viadana, 19,165 ..... B 3
Viareggio, 41,375 ..... C 3
Vibo Valentia, 22,702 ..... E 6
Vicenza, 79,250 ..... B 3
Vicovaro, 3,404 ..... g 9
Vieste, 11,982 ..... D 6
Vigevano, 41,734 ..... B 2
Vigne Nuove ..... h 9
Villacidro, 9,337 ..... E 2
Villafranca, 15,712 ..... B 3
Villaputzu, 3,731 ..... E 2
Viterbo, 43,367 ..... C 4
Vittoria, 43,643 ..... F 5
Vittorio Veneto, 25,239 ..... B 4
Vizzini, 15,016 ..... F 5
Voghera, 32,674 ..... B 2
Volterra, 18,243 ..... C 3
Voltri, 16,011 ..... B 2

Population 46,272,000

SAN MARINO

Population 12,950

Cities

San Marino, 2,410 ..... C 4

TRIESTE FREE TERRITORY

Population 359,000

Cities

Pirano, 14,857 ..... B 4
Trieste, 280,000 ..... B 4

Physical Features

Adda R. ..... B 2
Adige R. ..... B 3
Adriatic Sea ..... B 4
Agri R. ..... D 6
Albano, Lake ..... h 9
Alicudi (Isl.) ..... E 5
Alps (Mts.) ..... B 1
Amaro, Mt. ..... C 5
Aniene R. ..... h 9
Apennines (Mts.) ..... B 2
Arno R. ..... C 3
Arrone R. ..... h 8
Asinara, Gulf of ..... D 2
Asinara Isl. ..... D 2
Astura R. ..... h 9
Belice R. ..... F 4
Bergamo Alps ..... A 2
Biferno R. ..... D 5
Bolsena, Lake ..... C 3
Bonifacio, Strait of ..... D 2
Bracciano, Lake ..... C 4
Bradano R. ..... D 6
Cagliari, Gulf of ..... E 2
Capraia (Isl.) ..... C 2
Caprara Pt. ..... D 2
Caprera (Isl.) ..... D 2
Capri (Isl.) ..... D 5
Carbonara, Cape ..... E 2
Catacombs (Ruins) ..... h 9
Catania, Gulf of ..... F 5
Cenis, Mt. Pass ..... B 1
Coghinas R. ..... D 2
Colli Albani (Hill) ..... h 9
Colonne, Cape ..... E 6
Comino, Cape ..... D 2
Como, Lake ..... B 2
Corno, Mt. ..... C 4
Dell 'Alice, Pt. ..... E 6
Di Monte Santu, Cape ..... D 2
Dolomites (Mts.) ..... A 3
Dora Baltea R. ..... B 1
Egadi Is. ..... F 4
Elba (Isl.) ..... C 3
Etna, Mt. (Vol.) ..... F 5
Filicudi (Isl.) ..... E 5
Flumendosa R. ..... E 2
Gaeta, Gulf of ..... D 4
Galera, La, R. ..... h 8
Garda, Lake ..... B 3
Genoa, Gulf of ..... B 2
Giannutri (Isl.) ..... C 3
Giglio (Isl.) ..... C 3
Gr. St. Bernard Pass ..... B 1
Incastro R. ..... h 9
Isarco R. ..... A 3
Ischia (Isl.) ..... D 4
Iseo, Lake ..... B 3
La Cisa Pass ..... B 2
Laurentum (Ruins) ..... h 8
Lesina, Lake ..... D 5
Levanna, (Mtn.) ..... B 1
Licosa, Cape ..... D 5
Ligurian Sea ..... C 2
Linaro, Cape ..... C 3
Lipari (Isl.) ..... E 5
Lipari Is. ..... E 5
Liri R. ..... D 4
Little St. Bernard Pass ..... B 1
Maggiore, Lake ..... A 2
Malafede R. ..... h 8
Manfredonia, Gulf of ..... D 6
Mannu R. ..... E 2
Maritime Alps ..... B 1
Marmora, La (Peak) ..... D 2
Martignano, Lake ..... g 8
Mediterranean Sea ..... E 2
Messina, Strait of ..... F 5
Montecristo (Isl.) ..... C 3
Monte Rosa (Mtn.) ..... B 1
Montone R. ..... B 3
Moscarello R. ..... k 9
Naples, Bay of ..... D 4
Nemi, Lake ..... h 9
Nera R. ..... C 4
Noto, Gulf of ..... F 5
Ofanto R. ..... D 5
Oglio R. ..... B 3
Ombrone R. ..... C 3
Oristano, Gulf of ..... E 2
Orosei, Gulf of ..... D 2
Panarea (Isl.) ..... E 5
Panaro R. ..... B 3
Pantelleria (Isl.) ..... F 4
Passero, Cape ..... F 5
Pelagruž, Is. ..... C 6
Pescara R. ..... C 4
Pianosa (Isl,) ..... C 3
Pianosa Isl. ..... C 5
Piave R. ..... A 4
Po, Mouths of the ..... B 4
Po R. ..... B 3
Policastro, Gulf of ..... E 5
Pontine Is. ..... D 4
Ponza (Isl.) ..... D 4
Potenza R. ..... C 4
Reno R. ..... B 3
Rhaetian Alps ..... A 2
Rizzuto, Cape ..... E 6
Rosa, Mtn. ..... B 1
Salerno, Gulf of ..... D 5
Salina (Isl.) ..... E 5
Salpi, Lake ..... D 6
San Antioco (Isl.) ..... E 2
Sangro R. ..... D 5
Sanguinara R. ..... h 8
San Pietro (Isl.) ..... E 2
Santa Croce, Cape ..... F 5
Santa Eufemia, Gulf of ..... E 6
Santa Maria di Leuca, Cape ..... E 7
Sardinia (Isl.) ..... D 2
Savo R. ..... h 9
Secchia R. ..... B 3
Sésia R. ..... B 2
Sicily (Isl.) ..... F 4
Spartivento, Cape ..... E 2
Spartivento, Cape ..... F 6
Squillace, Gulf of ..... E 6
Stromboli (Isl.) (Vol.) ..... E 5
Tanaro R. ..... B 2
Taranto, Gulf of ..... D 6
Taro R. ..... B 2
Tevere (Tiber) R. ..... C 4
Tiber, see Tevere ..... C 4
Ticino R. ..... B 2
Tirso R. ..... D 2
Trasimeno, Lake ..... C 4
Tremiti Is. ..... C 5
Tre Teste R. ..... h 9
Trieste, Gulf of ..... B 4
Tusculum (Ruins) ..... h 9
Tyrrhenian Sea ..... D 3
Ustica (Isl.) ..... E 4
Vaccina R. ..... h 8
Varano, Lake ..... D 5
Vaticano, Cape ..... E 5
Venetian Alps ..... A 4
Venice, Gulf of ..... B 4
Vesuvius (Vol.) ..... D 5
Villa Adriana (Ruins) ..... h 9
Viso, Mt. ..... B 1
Volturno R. ..... D 5
Vulcano (Isl.) ..... E 5

Clyde Brown

Horned Oxen Pull the Plow not far from the modern city of Rome. The young Italian woman guides the slow beasts with a rope and a stick. The flat countryside surrounding Rome was once a swamp, but today it is a rich farming region.

early Middle Ages, and mingled with the native stock. In more recent times, French, German, and Slavic peoples have settled there. The island of Sicily has been a true melting pot. It has received the same peoples as the rest of Italy, as well as some Carthaginians, Greeks, Arabs, and Normans.

The Italians are famous for their love of beauty. In Italy one can find crowds of poorly clad working men thronging the art museums on Sundays and holidays, or listening appreciatively to great music whenever they have the chance.

The people of Italy are very unevenly distributed over the country. Dry, sterile Calabria in the south is thinly populated in comparison with the rest of Europe. But in parts of the Po Valley there are more than 300 persons to the square mile, and in the Campagna the population runs about 700 to the square mile. People in these particular regions are more crowded even than in Belgium, which is one of the most densely populated countries of Europe.

Italy's population keeps growing steadily. In 1940 there were nearly half a million more births than deaths, and this is only a little over the average gain of the preceding ten years. For many years Italy's surplus population emigrated to other lands. But during the Fascist regime, Italians were encouraged to stay at home, serving in the armies and producing materials for war. They could live only by eating less per person. During and after World War II, the average Italian knew the meaning of hunger. The standard of living in Italy is low except in the Po Valley. Modern industrial development has raised the standard for only a few cities in the north.

Agriculture gives employment to about half the workers of Italy. Agriculture also uses about two thirds of Italy's land surface. Farm land makes up about twenty-eight million acres, and land used for forest, forage, and pasture covers about 26,000,000 acres.

Farming. Two thirds of Italy's plowed lands are planted in grain. Wheat, the ancient food of the Mediterranean world, is by far the most important grain. Wheat flourishes in many parts of Italy, for its roots grow well during the rainy winter and it can mature in the drier summer. But in spite of great effort and a large production, Italy has never been able to raise enough wheat for its own people. In normal times, more than 800,000 tons must be imported every year. To fill out the grain supply, corn has been introduced from America, but it is grown in large quantities only in parts of northern Italy.

Grapes and olives are important food products. Olives grow on stony hillsides, and Italy has plenty of these. Italy leads the world in the production of olives for olive oil. Grapes are made into wine, some of which is exported. It may seem strange that a country which has to import food should devote nearly two and a half million acres to grapes for wine. One reason for this is that much water in Italy, and in the rest of Europe, is unsafe for drinking, and people must drink something else.

No region of Europe is more intensively farmed than

Clyde Brown, Gendreau

Italian Girls with Water Casks await their turn to draw water at a roadside well near Rome. Italian women and girls are expert at balancing heavy burdens on their heads.

Pietzsch, Black Star

The Vendor's Cart is a common sight on the streets of Italian cities. Olives and other fruits, vegetables, wine, and even many cooked foods are sold at the curb.

the Po Valley. This region carries on "three-storied" farming. The fields support wheat, corn, root crops, flax, and vegetables. Trees are planted around each field to produce fruit and the mulberry leaves on which silkworms are fed. Vines for grapes are strung between the trees, so that every bit of space is used productively. Scattered about the land are square, Roman-type farm houses. Part of each house is used for living quarters and part as stables for oxen, cows, or goats. A grape trellis is usually strung over the back door of the house, and other grape arbors are crowded in wherever there is room.

The island of Sicily is also a rich farming region. Its interior plateau is well watered in winter, and produces great quantities of vegetables for the European market. The low plains on the east and south are known for citrus fruits. Almonds, figs, dates, and melons are grown.

Grazing. Nearly ten million sheep and goats graze on the mountain pastures of Italy. Italy also has about seven and a half million cattle, but cows fed on the kind of grass that grows in Italy do not produce much milk. Italy's goats produce an important part of the country's milk supply. Goatskins are also the basis of a large glove industry. Oxen are the common draft animals, but donkeys and horses are raised for the same purpose.

Stock grazing is carried on scientifically only in northern Italy. The famous Italian cheeses, Parmesan and Gorgonzola, are made in northern Italy and shipped to many parts of the world.

Minerals. Italy is famous for only one mineral product, its beautiful Carrara marble. (See MARBLE.) Two other minerals are fairly important. They are bauxite, from which aluminum is made, and sulfur. Sulfur is found in its natural state around the volcanic cone of Mount Etna. Some sulfur is also obtained from pyrite, or iron sulfite. Before the discovery of the great sulfur formations in Louisiana, Italy led the world in the production of this mineral. A little iron is mined in Tuscany and on the island of Elba. Italy does not have enough coal or other fuel to support a large smelting and refining industry. Most ores are sent to other countries to be processed. Some mercury is mined.

Manufactures. Lack of coal and of raw materials has held back Italy's development as a manufacturing country. The best Italian manufactures are those which require hand labor. Italy has long been famous for such articles as ivory carvings, marble and alabaster pieces, mosaics, enamels, jewelry and filigree work, fine pottery, lace, and embroidery. The making of straw goods, such as Leghorn and Milan hat braids, is also an industry in which Italians excel. Thousands of women and girls do this kind of work. Much of the delicate Italian hand work is done in small factories or in Italian homes.

The growing of silkworms and the spinning and weaving of silk employ a great many workers, both men and women. The silk industry is carried on in all parts of Italy, but it is most important in the north. The making of woolen and cotton textiles is growing, and Italy has made important progress in the manufacture of rayon. Beet-sugar refining and the making of macaroni are well-developed industries. Some attempts have been made to develop heavy industries, and a few factories turn out iron and steel products, chemicals, airplanes,

Clyde Brown

Women Prune and Tie Grapevines in a sunny hillside vineyard. The grapes will be used to make the fine Italian wines that are shipped to all parts of the world. Vineyards and olive groves are found on almost every Italian farm.

and automobiles. Most of Italy's industry depends upon water power, and so must be concentrated in the northern part of the peninsula.

Trade. Most of Italy's trade is carried on with three countries, the United States, Argentina, and Germany. In normal times, the value of the goods Italy sends to other countries is a little less than the value of the goods that must be shipped into the country. Italy receives an important income from the tourist and student trade. This income helps to pay for imported goods. Tourists from northern Europe like to spend the winter in the Italian sunshine. The students include many priests who come to Rome to study. Many students of music also study in Italy, especially in and around Milan.

Transportation and Communication. Italy has about 13,400 miles of railroad. Because of the shortage of coal, many railroads have been electrified. Most of the railroads of Italy are owned and operated by the government.

Italy also has more than 103,000 miles of highways and roads, most of which are suitable for motor traffic. Some of the roads have existed since Roman days.

Italy has a well-developed telephone and telegraph system. There is about one telephone for every forty-six persons. There are also several radio stations.

Cities. The cities and towns of Italy are among the most famous in the world for their beauty of location, antiquity, artistic distinction, and literary association. The cities of Florence, Genoa, Herculaneum, Milan, Naples, Palermo, Pompeii, Rome, Turin, and Venice are described under their own names in THE WORLD BOOK ENCYCLOPEDIA. Other cities of interest or importance are described below.

Amalfi, *ah MAHL fee* (pop. about 6,000), is a picturesque town on a steep rocky headland overlooking the Bay of Salerno. The town is situated in the department of Campania, about twenty-two miles southeast of Naples. Row on row its houses rise from the sea to the mountains. Amalfi is the delight of tourists, who travel there from Sorrento over a winding automobile road commanding magnificent views of the sea. A cathedral dating from 1204 and an old Capuchin monastery, now used as a hotel, are the chief points of interest. In the Middle Ages, Amalfi was a powerful city state of 50,000 inhabitants. Fishing and the making of macaroni are important industries.

Anzio, *AHN tsee oh* (pop. about 8,000), is a small seaport and resort on the western coast of Italy, thirty-six miles south of Rome. The city was often mentioned in newspaper accounts of the Italian campaign, toward the end of World War II. American troops landed at Anzio and established a beachhead in January, 1944. The beachhead was the scene of heavy fighting as the Americans sought to break through German defense lines.

Arezzo, *ah RET soh* (pop. about 67,000), is built on a beautiful hillside fifty-four miles southeast of Florence. It is the seat of the Bishop of Tuscany, and its cathedral, a fine example of Italian Gothic architecture of the 1200's, is among the attractions of the city. Arezzo manufactures cloth, silk fabrics, and leather. In ancient times, the city was called Arretium, and was one of the richest cities of Etruria. It was especially famed for pottery and copper work. Petrarch, a famous Italian poet and scholar of the fourteenth century, was born in Arezzo.

Bari, *BAH ree* (pop. about 269,000), is a busy seaport on the southern Adriatic coast. It is noted for commerce and manufactures. As early as the 400's B.C., Bari was a place of importance. It has been destroyed and rebuilt three times. Several ancient churches remain, including a massive cathedral and the Church of Saint Nicholas (founded 1087), which is visited by thousands of pilgrims every year. Here the original Saint Nicholas is buried. See SANTA CLAUS.

Bologna, *boh LO nyah* (pop. about 342,000), is situated in a lovely region of pleasant climate and fruitful soil in northern Italy. It is an important industrial center, manufacturing silks, velvets, and the widely known Bologna sausage. The people are progressive and industrious, but the city, with its narrow and crooked streets, still has a medieval appearance. One of its most striking features is the system of arcades which shelter the shops on each side of the street. Bologna has 130 churches which date from the early 1200's down to the modern era. Of the 180 leading towers which ornamented the city in the Middle Ages, only two, dating from about 1110, remain.

The art treasures of Bologna are world-famous. The most famous of its pictures is Raphael's "Saint Cecilia," painted for the Church of Saint Giovanni in 1516. Bologna is an ancient center of learning. Its university, founded in 1088, is one of the oldest and most famous schools in the world.

Cassino, *kahs SEE noh* (population about 21,000), lies on the banks of the Rapido River in Frosinone province. The famous Benedictine monastery of Monte Cassino has been the home of Benedictine monks since A.D. 529.

Cassino was the scene of fierce fighting during World War II when German troops made a stronghold of the city and resisted Allied attempts to advance. The city was taken by the Allies in May, 1944.

Catania. See SICILY (Cities).

Leghorn, officially LIVORNO, *lee VOR noh* (pop. about 146,000), ranks next to Genoa and Naples as a busy seaport in Italy. It is situated on the Ligurian Sea, about sixty-two miles southwest of Florence. Leghorn hats, made from wheat straw, and beautiful coral ornaments are exported. Other exports include marble, olive oil, boracic acid, silk, and wine. Leghorn resembles Venice in that it has many canals.

The most interesting of its public buildings include the Cathedral, a Jewish synagogue, the Academy of Sciences, and the naval academy. The "Tower of the Sculptured Lion," one of the leading landmarks, is the only relic of the days when the city was a free port.

Leghorn was a little fishing village when it came into the possession of the Florentines in 1421. It has grown steadily in importance and prosperity. In season, the sulfur springs and sea bathing attract many visitors.

Lucca, *LOOK kah* (pop. about 89,000), sometimes known as *Lucca the Industrious*, is a picturesque city situated in the northern part of Italy, thirteen miles northeast of Pisa. It is noted for its old churches, some dating back to the 600's and 700's, and for its artistic and scientific institutions. The city has an extensive trade, particularly in olive oil and textiles. The modern city market stands on the site of a large Roman amphitheater. The surrounding country abounds in beautiful villas. Sixteen miles north of the town are the Baths of Lucca, famous since the 1600's.

Messina, *meh SEE nah.* See SICILY (Cities).

Modena, *maw DA nah* (pop. about 116,000), lies in a broad fertile plain of northern Italy about twenty miles south of the Po River. Modena is the ancient city of Mutina that the Romans captured from the Boii in 215 B.C. It was almost wholly destroyed by the Huns in the 400's, and the ravaging Lombards later completed its destruction. It was refounded by Mathilda of Tuscany in the 1000's. She ordered the beginning of the construction of its splendid cathedral. The later Dukes of Tuscany built several fine palaces which are now used as schools, museums, and art galleries, for which the city is noted. Modena has a small trade in linen, silk goods, and iron.

Young Shepherds Tend Their Flocks on the Grounds of a spacious villa in the outskirts of Naples. This great seaport city next to the smoking volcano of Mt. Vesuvius is one of the gayest and most beautiful in the country.

Clyde Brown

Homes of Sicilian Fishermen Cling to the Cliffs at the water's edge in the town of Cefalu. Most of the stone houses are hundreds of years old. Fishing boats lie in the harbor. They are painted in bright colors and have brown sails.

GRAND OR HUMBLE, ITALIAN HOMES ARE PICTURESQUE

Padua, *PAD yu ah* (pop. about 168,000), called PADOVA in Italian, is the oldest city in all of northern Italy. It is situated on the Bacchiglione River, 22 miles southwest of Venice. The city has seven gates. Many of its narrow, crooked streets are lined with arcades. Several high Roman bridges cross the various arms of the river, and there are numerous medieval palaces and churches. Padua's art treasures keep alive the memory of some of Italy's greatest masters—Donatello, Guido Reni, Canova, Giotto, Fra Filippo Lippi, and others. Galileo lectured for eighteen years in Padua's famous university, which was founded in 1222 by Emperor Frederick II. A celebrated Botanical Garden, the oldest in Europe, is connected with the university.

The Roman historian Livy was born in Padua, and at one time Dante lived there. Padua has a flourishing automobile factory and a prosperous trade in fruit, grain, wine, and cattle.

Parma, *PAHR mah* (pop. about 123,000), a town of north central Italy, dates from the period of the Roman republic. It is interesting as the home of many notable art treasures. The cathedral dates from the 1000's and is an example of Lombard-Romanesque architecture built in the form of a Latin cross. Its cupola contains Correggio's celebrated fresco, *Assumption of the Virgin.* There are many other great paintings in the city. Parma was the home of Correggio for many years. The city's most notable educational institution, the University of Parma, was founded in 1502.

The city lies on a small stream, also called Parma, and is seventy-five miles southeast of Milan. The fortifications have been replaced by wide walks. The site of the place was originally occupied by a village of the Bronze Age.

Pavia, *pah VE ah* (pop. about 67,000), is the seat of an old university founded before the 900's. In the days of the ancient Romans, the city was known as Ticinum, and was a place of considerable importance. Pavia was important in the wars of the Middle Ages, and was plundered by Napoleon in 1796.

Modern Pavia is situated on the Ticino River, near the place where it meets the Po, eighteen miles south of Milan. The place still has the general look of a city of olden times. The oldest of the many interesting churches is the Church of San Michele. In the cathedral Church of San Martino is a sarcophagus containing the ashes of Saint Augustine, and north of the city is the finest monastery in the world, the Certosa di Pavia.

Industrially, modern Pavia is known for its manufacture of pipe organs, and for its trade in wines, silk, oil, and cheese.

Pisa, *PE zah,* or *PE sah* (pop. about 85,000), an old city of Tuscany famed for its beautiful marble bell tower (see LEANING TOWER OF PISA). It is situated on both banks of the River Arno, six miles from the Ligurian Sea and forty-nine miles southwest of Florence. Pisa contains a university founded in 1343 and an academy of fine arts established by Napoleon. The town possesses many valuable art treasures. The house where Galileo was born is a feature of special interest. Industrially, the place is important as a center of cotton manufacture. It also has some trade in oil and marble.

Salerno, *sah LAIR no* (pop. about 92,000), is the seaport capital of the province of Salerno. The city is built on the Gulf of Salerno, about thirty miles southeast of Naples. It is one of the Italian centers of Mediterranean shipping.

Salerno was the seat of an early medical school in the period from the 1000's to the end of the 1200's. Some of the churches in the city, including the Cathedral of San Matteo, were built during the same period. The Normans controlled Salerno at that time. One of the battles of World War II centered around Salerno. Allied troops landed on the beaches at Salerno in September, 1943, and captured the city in spite of a determined German counterattack.

San Remo, *sahn RAY mo* (pop. about 37,000), is a popular resort in the Italian Riviera. It is built on the banks of the Ligurian Sea, about thirty miles east of Nice, France. The city has many hotels and lovely villas, which were built to take care of the tourist trade. Tourists are attracted to San Remo because of the delightful climate and the broad, white bathing beaches. The city is also a port. The chief products shipped are oranges, lemons, flowers, and mosaics.

Syracuse. See SYRACUSE.

Taranto, *TAH rahn toh* (pop. about 193,000), is a fortified city and seaport in southern Italy. It is situated on a rocky island which lies between the Gulf of Taranto and the Little Sea, an inlet of the gulf. The place occupies the site of Tarentum, one of the leading cities of the ancient Greek world. For hundreds of years Taranto has been famous for its oyster and mussel fisheries, which give work to great numbers of inhabitants. The town is poorly built, with narrow streets and small houses.

On November 11, 1940, the British Royal Air Force delivered a staggering blow to the Italian fleet assembled in the port of Taranto. Half the Italian battle fleet was disabled for at least six months.

Terni, *TEHR nee* (pop. about 82,000), is the capital of the province of the same name in the Umbria region. The city lies near the slopes of the Apennine Mountains below the junction of the Nera and Velino rivers. Terni is an important manufacturing center. There are large iron and steel works here, and arms factories producing guns and shells for the Italian navy. Other manufactures of Terni include carbide, wool, and jute.

Terni is one of the most ancient cities of Italy. Near it are the remains of Stone Age villages and burial grounds and ancient Roman ruins.

Verona, *veh RO nah* (pop. about 197,000), lies in a picturesque location at the foot of a spur of the Tirolese Alps, seventy-one miles by rail west of Venice. It is on the banks of the powerful Adige River. In literary history it is famous as the reputed home of Romeo and Juliet, and the house in which Shakespeare's heroine is said to have lived is pointed out to sightseers.

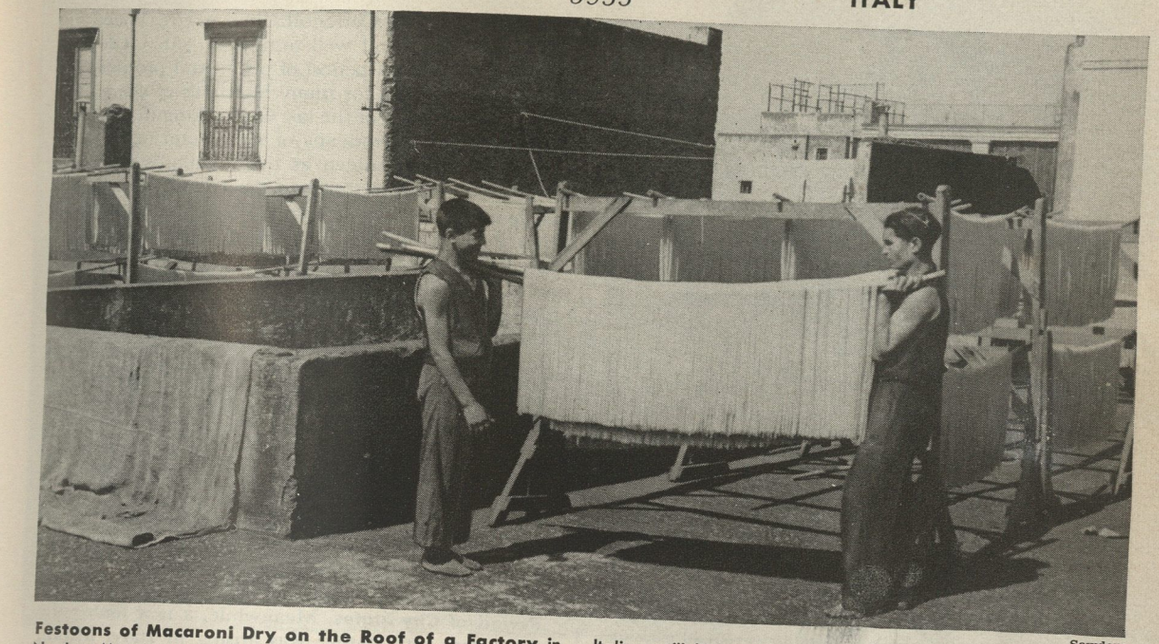
Verona presents a fascinating combination of ancient, medieval, and modern civilizations. The city was a prosperous Roman colony before the beginning of the Christian Era, and there are still many interesting Roman ruins, including a magnificent amphitheater, built by the Emperor Diocletian. During the Middle Ages, Verona was an art center of first rank, and numbered the great painter, Paolo Veronese, among its native sons.

Modern Verona has several industrial establishments and an active trade in wine, fruits, and marble.

Vicenza, *vee CHENT sah* (pop. about 79,000), is a picturesque city lying about forty miles northwest of Venice. It is enclosed by a moat and walls, now almost in ruins. The city is indebted to the famous architect Palladio, a native of Vicenza, for many of its finest buildings. The Duomo, a fine Gothic church, is enriched by many paintings of ancient masters. The city has several educational institutions and important silk and rayon manufactures.

Clyde Brown

Gay Paintings Cover the Sides of This Cart in the Sicilian capital city of Palermo. The upright posts are gracefully carved with a head at the top of each. Donkey carts of this kind are seen everywhere on Italian roads.



Sawders

Festoons of Macaroni Dry on the Roof of a Factory in Naples. Most macaroni factories have drying rooms, but the Italians still like sun-dried macaroni best. It was once dried in the streets, but this is now forbidden by law.

Social and Cultural Achievements

Leading Colleges and Universities: *Bologna,* founded in 1088; *Firenze* (Florence), 1924; *Genoa,* 1243; *Messina,* 1549; *Milan,* 1924; *Naples,* 1224; *Padua,* 1222; *Palermo,* 1805; *Rome,* 1303; *Turin,* 1404.

Leading Museums and Art Galleries: *Museo Nazionale,* or *National Museum,* founded at Florence during the middle 1200's; *Museo Nazionale,* or *National Museum,* built in Naples in 1586 for use as military barracks, made into a museum in the late 1700's; *Vatican Museums* at Rome, including the *Sistine Chapel,* built in 1473, the *Pauline Chapel,* opened in 1540, the *Library Hall of the Greek Cross, Hall of the Animals,* and *Gallery of Statues; Borghese, Capitoline,* and *Barracco* at Rome; *Pitti Palace* and *Uffizi* at Florence.

Education. Italian children are compelled to attend school from the age of six to the age of fourteen. Compulsory education laws have often been poorly enforced. Almost a third of the Italian people still cannot read or write. Most persons in the larger cities of northern Italy have had some education, but in other parts of the country, where schools are scattered and far apart, authorities believe that the rate of illiteracy may run close to 30 per cent.

The eight years of compulsory education are divided into three grades. Children from six to nine attend the so-called "maternal schools," or *Asili.* The next three years are known as the *lower school,* and the last two years as the *higher school.* Secondary schools specialize in the study of the classics, the study of science, or the preparation of teachers. There are also technical second-

H. Armstrong Roberts

Lake Como Lies Near the Foot of the Italian Alps in northern Italy. The blue water is surrounded by rugged mountains. It is one of the country's favorite resort regions.

ary schools of agriculture, commerce, and industry. Italy has more than eighty schools specializing in art and music. Nearly 175,000 students attend Italy's colleges and universities, some of which are world famous. Bologna, the oldest university in Italy, is 773 years older than the Italian nation itself.

Language and Literature. See ITALIAN LANGUAGE; ITALIAN LITERATURE.

Art. Italy has played a larger part in the history of art than has any other country except ancient Greece. For hundreds of years, painters did not consider themselves educated until they had studied in Italy. The place of Italy in the world of art is treated in the articles PAINTING and SCULPTURE.

Religion. More than 99.5 per cent of Italians belong to the Roman Catholic faith. Rome has been the center of this faith since the 300's. At one time the church had full control of broad lands in central Italy. After Italy became a nation, the Italian Government claimed power over the land. Pope Pius IX protested this claim and announced that from then on he would consider himself a prisoner in the Vatican. The Popes who came after him continued this method of protest until 1929. At that time, Benito Mussolini, the dictator of Italy, made an agreement which restored the Pope to the position of sovereign ruler of a new, though much smaller, papal state. See VATICAN CITY.

Government and History

The Middle Ages. We cannot treat the whole history of the Italian peninsula under the title *Italy*. Until A.D. 476, the history of Italy made up part of the history of Rome. Odoacer, who set up his government on the ruins of the Roman Empire, was the first to call himself king of Italy. Odoacer lost his kingdom to Theodoric the Great, king of the Ostrogoths, in A.D. 493. Theodoric ruled Italy wisely and well until A.D. 526. Under his reign Italy enjoyed a period of peace and prosperity it was not to see again for many hundreds of years.

After the downfall of the last Gothic king in A.D. 552, Italy became a dependency of the Byzantine Empire. A Germanic tribe known as the Lombards gradually moved farther and farther into the Empire and finally threatened Rome itself. The Pope asked the aid of Pepin, leader of the Franks, who checked the advance of the Lombards. Charlemagne, Pepin's son, completed the conquest of the Lombards and had himself crowned emperor with the famous Iron Crown of Lombardy. He also confirmed the gift of land which his father had made to the Pope.

Division and Anarchy. After the breakdown of Charlemagne's empire in 843, kings and emperors frequently fought for control of Italy. Otto the Great was crowned Holy Roman Emperor in 962. He put an end to this period of confusion. Through the Middle Ages the emperors regarded themselves as rulers of Italy. But some of the Italians resented German control, and there were constant revolts. Many emperors had to fight hard to uphold their authority. The strongest opponents of the emperors were the Popes.

Period of City States. Meanwhile, a new force—the independent city states—was arising in Italy. Milan, Genoa, Florence, Pisa, Venice, and other cities made themselves practically independent. The city states grew so powerful that they could resist the nobles who tried to bring them under control, and even the emperor. The Popes often aided them against the emperor.

A brilliant life grew up around the Italian cities, and the period might have been one of glory and prosperity for Italy. But in every city a struggle raged between the Guelphs and the Ghibellines, two rival groups whose feud wasted the energies and resources of Italy. The cities could enjoy peace only when some powerful family of nobles had made itself supreme. Between 1350 and 1500, cities under the rule of such families as the Medici in Florence were the only important part of Italy. This period in Italian history is sometimes called the Age of Despots. See GUELPHS AND GHIBELLINES.

Age of Invasion. About the time America was discovered, a period of foreign invasions began in Italy. In 1494, King Charles VIII of France made himself master of Naples and was crowned king there. Charles soon withdrew, but he had shown the world that the disunited cities of Italy were an easy prey. French and Spanish kings began to seize territory as they pleased. The emperor Charles V, ruler of Spain as well as of the Holy Roman Empire, finally brought Italy under his control. German and Spanish troops ravaged the peninsula, took Rome by assault, and did great damage to its many treasures. Under the rule of Charles V, Italy enjoyed a period of comparative peace.

For the next 200 years, Italy had no real history of its own. Italian territories were prizes, fought for by the monarchs of Europe and occasionally by petty Italian princes. Many armies invaded Italy and fought on its soil. Hired professional soldiers called *condottieri* were in the ranks of some of the armies which invaded Italy. The condottieri were adventurers and skilled fighters,

Ewing Galloway; Gendreau

The Appian Way and the Aqueduct of Claudius were built more than 2,000 years ago. Donkey carts and automobiles travel over parts of the famous road on which great Roman legions marched. The arches of the aqueduct ruins are still solid.

Gendreau

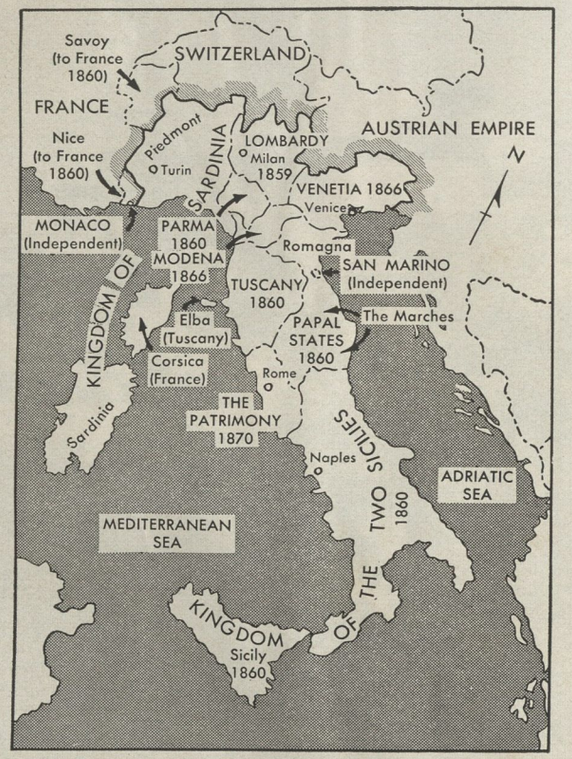
The Little Town of Capalbio, Italy, is a good example of a well-fortified medieval town. A high watch tower rises above the buildings, which are crowded on a hilltop. The remains of a turreted wall still circle the old town.

and there was no Italian army to oppose them. Most of the old families which had ruled in the days of the city states were dying out.

The French Revolution. The forces which led to the great revolution in France were at work in Italy during the late 1700's. When the French Revolution broke out, Italian states tried to join in the coalition against France. As a result, Napoleon invaded the peninsula and crushed all resistance. Under Napoleon, Italy became a French dependency. The Treaty of Campo Formio in 1797 gave Venice to Austria, and divided the rest of Italy into five republics, with Milan, Genoa, Rome, Bologna, and Naples as capitals. After 1800 Napoleon transformed Italy into a kingdom and crowned himself king by putting the Iron Crown of Lombardy on his head with these words: "God gave it to me; woe to him who dares touch it." He then made his stepson a Viceroy of Italy. He named his brother Joseph, and later his brother-in-law Joachim Murat, King of Naples. Pope Pius VII was kidnapped and held captive in France until the downfall of Napoleon in 1814. In 1811 Napoleon proclaimed his newborn son King of Rome. See NAPOLEON.

Napoleon's distribution of the territories of Italy had a lasting effect. By blotting out old boundary lines, it made the people forget their old provincial divisions, and awakened them to the fact that they were all Italians. The desire for independence was born.

Early Stages of the Struggle. In 1815 came the Congress of Vienna. Its rulings left Italy largely in the hands of Austria and the Papacy. The House of Savoy, which had been driven out during the revolutionary times, received again its kingdom of Sardinia. The Kingdom of the Two Sicilies went again to the Bourbon Ferdinand, and the Pope recovered all the states of the Church. Elsewhere, Austria was all-powerful.



The Italian States, and the dates they were annexed by Victor Emmanuel to form a unified Kingdom of Italy

All the growing wishes for unity and independence were crushed by the reactionary policy of Austria. Austria instituted a reign of terror to root out all liberalism. But the desire for freedom and unity had grown too strong to be suppressed. On every hand, secret revolutionary societies came into being. Conspiracies against the foreign rule were formed in every part of Italy.

In 1831, a new king, Charles Albert, came to the throne of Sardinia. He proved more liberal than the king before him, and his concessions caused the other states to look toward him as the possible head of a new united Italy. The dominant spirit of the times was Giuseppe Mazzini, head of the organization known as Young Italy. The aim of the society was to free the Italian peninsula from Austrian rule and to bind the country together under a republican government.

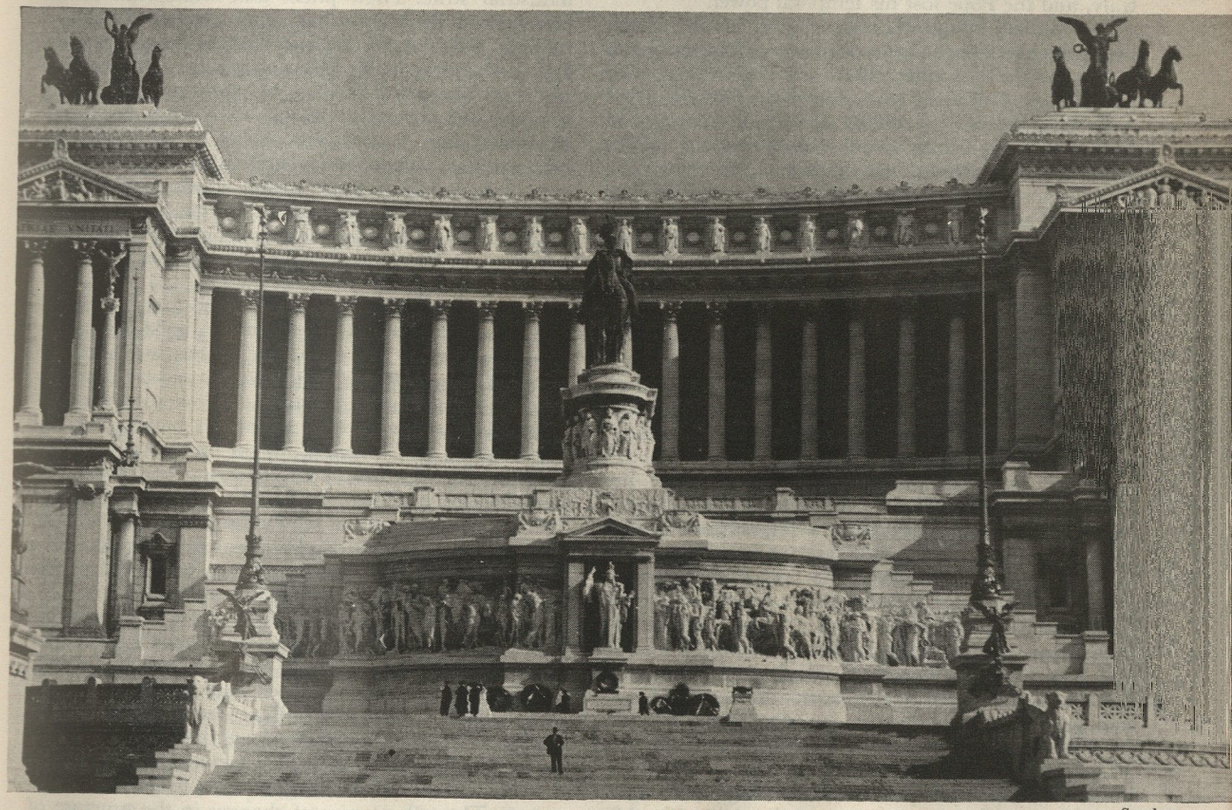
Unlike other organizations with similar purposes, the Young Italians did not try to accomplish their aims by conspiracy, but rather by open insurrection. The plan of Mazzini was to have the educated youth agitate among the masses in order to rouse them against both the domestic and the foreign despots who ruled in the Italian states. After the despots were driven out, a national assembly would be summoned to create an Italian republic on democratic principles.

In 1848, a revolutionary wave swept over all western Europe. Italy felt it keenly, and insurrections took place throughout the country. In Naples and Venice, the rulers were forced to grant constitutional rights. The people of Milan actually drove the Austrians from their city. In Rome, Pope Pius IX was driven out, and the city fell under the control of Mazzini and his famous follower, Garibaldi. But the Roman republic was short-lived. A French army, sent by Louis Napoleon, intervened on behalf of the Pope. Rome was captured by the French, who suppressed the republic and restored the city to the Pope. The Sicilians threw off the Bourbon yoke. Charles Albert of Sardinia went so far as to declare war on Austria, but the Austrians defeated him decisively at Novara in 1849. At once the reactionary forces throughout the peninsula took heart and regained their supremacy.

In Sardinia, however, the liberal spirit continued. Victor Emmanuel II, who came to the throne when his father abdicated in 1849, upheld the policy of Italian freedom and rejected all overtures from Austria. One of his services to Italy was the choice of Count Cavour as Prime Minister. Without Cavour's farsightedness the achievement might not have been possible.

The Unification of Italy. Cavour's great ambition was to secure the aid of France in throwing off the yoke of Austria. In this endeavor he was at last successful. Early in 1859, French forces crossed the Alps, and the final struggle for a free Italy began. The Austro-Sardinian War, as it was called, lasted only about two months. The great victories of Magenta and Solferino compelled

Sorrento Looks Out over the Bay of Naples from the top of sheer cliffs. Steep winding roads lead down to the water where fishermen bring in their boats. Just a few miles to the north across the bay, Mt. Vesuvius belches fire and smoke.



Sawders

The Great White Monument to Victor Emmanuel II contains the tomb of Italy's Unknown Soldier. It stands near the ancient Colosseum and the Roman Forum. During the recent Fascist period, it was a favorite place for great meetings.

SCENES IN HISTORIC ITALY

Austria to give up Milan and Lombardy. Then Cavour found to his disappointment that Napoleon III was prepared to go no further. In spite of his pledge to "free Italy from the Alps to the Adriatic," he made peace with Austria, and did not even trouble to ask the consent of his Sardinian allies. But the tide had set in the direction of unity, and could not be turned back. Tuscany, Modena, Parma, and Romagna declared for annexation to Sardinia, but the rejoicing at this triumph was tempered by grief at the surrender of Nice and Savoy, the original home of the House of Savoy, to France as indemnity for its share in the war.

A famous expedition under the most adored of all Italian heroes, Garibaldi, resulted in the conquest of Sicily and Naples. In November, 1860, the Kingdom of the Two Sicilies was annexed to the domain of Victor Emmanuel, who in the following year was proclaimed king of Italy. Venice and Rome were the only parts of the peninsula still to be gained. Venice came to Italy as reward for its aid to Prussia in the Seven Weeks' War with Austria. However, to be a really united kingdom, Italy had to have its ancient capital, Rome. In 1867, Garibaldi with his volunteers made an attempt to seize the city, but the French stopped him. Three years later, when the French troops had been withdrawn from Rome for the war against Prussia, Victor Emmanuel entered the city and made it the capital of his dominions. The Papal States became a part of the unified Italy, and the Pope lost his temporal power.

The Modern Kingdom. After the unification, Victor Emmanuel set about the task of preserving peace and organizing the new state. This work was carried on by his successor, Humbert, who came to the throne in 1878. A political movement called *Irredentism* appeared in Italy about 1878. The Irredentists advocated joining neighboring territories, which they called *Italia Irredenta*, or unredeemed Italy, with the new unified state of Italy. The much-loved Humbert was assassinated in 1900, and his son came to the throne as Victor Emmanuel III. Attempts to establish a colonial policy and to give Italy a place among the great powers of Europe placed a heavy burden of taxation on the country.

On December 28, 1908, an earthquake shook all southern Italy and part of Sicily. It destroyed Messina, Reggio, and a number of smaller towns, and caused the death of more than 150,000 people. Southern and eastern Italy suffered severely for several years from a cholera epidemic.

In 1911 the peace policy of Italy was set aside, and war was declared on Turkey. The announced purpose of the war was to protect Italians in Tripoli. As a result of the brief conflict, Italy added Tripoli to its group of colonies. Turkey was allowed to keep a representative there as a concession to the Moslems.

Italy and World War I. In spite of the Triple Alliance with Germany and Austria, which existed from 1882 and was several times renewed, Italy felt none too kindly toward Austria, while relations with France had grown more and more friendly. Doubtless these facts had much to do with the attitude of Italy when World War I broke out in 1914.

For a year Italy kept out of the struggle, though it showed a decided leaning toward the Allies. On May 23, 1915, it declared war on Austria-Hungary. Declarations of war were later made against Bulgaria, Turkey, and Germany. Italy spent freely of its blood and treasure in months of fighting along the Austro-Italian frontier, and contributed much to the allied cause by keeping Austria's armies engaged there.

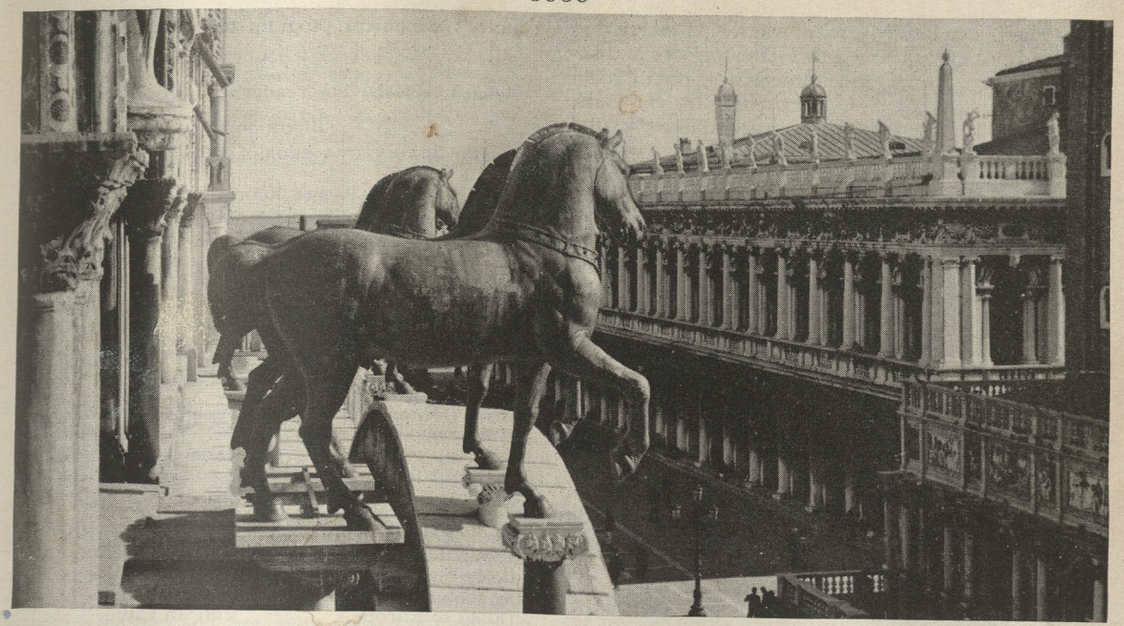
In the fall of 1917, however, after the collapse of Russia, German reinforcements and generalship brought about a terrible Italian defeat at Caporetto, a village in the northern part of Julian Venetia, on the Isonzo River. The Italians lost thousands of square miles of territory before they brought the enemy to a halt along the Piave River. With incredible efforts, the Italian Army was reorganized, and a year later, under General Armando Diaz, it overwhelmingly defeated the Austrians on the Asiago front. By helping to knock Austria out of the war, the Italians hastened the general armistice, which came a week later, on November 11, 1918.

As a sharer in the fruits of victory, Italy received the following territory in Europe: Venezia Tridentina, Gorizia and Gradisca; Trieste, Istria, Zara, and islands annexed from Dalmatia; and Fiume. There was no final decision concerning Fiume and Dalmatia until 1924 (see FIUME; RAPALLO, TREATIES OF). Eventually, Italy gained nearly 9,000 square miles of territory formerly included in the old Austro-Hungarian Monarchy.

Italy Under Fascism. The period of reconstruction following the close of the war was marked by political and industrial strife. High prices and widespread unemployment, difficulties in making a place for the returned soldiers, political unrest, and general discontent with Italy's treatment at the peace conference, all combined to disturb the peace of Italy. In 1919 and 1920 many workers and farmers went on strike. In a few cases, manufacturing plants were seized by socialist labor organizations. There were noticeable trends toward socialism, and for a short period it seemed that Italy might become a socialist state like the Soviet Union. This movement rapidly lost its force, chiefly because the labor parties themselves could not agree on a political and social program.

Benito Mussolini, an ex-soldier and former socialist, had organized a band of nationalists in March, 1919. Mussolini called this organization Fascists, after the fasces of ancient Rome which symbolized the power to compel law and order. During 1919 and 1920, the Fascists occupied themselves largely in building up an organization and in combating the socialist and Catholic labor organizations. The period was one of violence and disorder, in which the Fascists took a leading part. By 1921 the character of the Fascist party had changed. New and less radical members came into the organization, and its political program was altered to favor the industrialist and landowning classes.

By 1922, the Fascist party had become powerful enough to seize control of the government. In October, Mussolini ordered a general mobilization of Fascists. On Sunday morning, October 30, a Black Shirt army entered Rome. King Victor Emmanuel III had refused to declare martial law and oppose the Fascist army by force. He now sent for Mussolini and made him Premier. Once in control, Mussolini proceeded to consolidate his power. Through a series of changes in the structure of



Henle

The Famous Bronze Horses of St. Mark's Cathedral in Venice look out over the square before the church. They were brought to Italy from Egypt almost 2,000 years ago, and placed on St. Mark's in 1204. Napoleon took them to Paris in 1797, where they remained until his power ended in 1814. Then they were restored to their balcony on the cathedral in Venice.

the Italian government he had made himself absolute ruler of Italy and all its people by the middle of 1925.

Changes in Government. Before Fascism, Italy had a government rather like that of England. But the Italian people had not had the years of experience with parliamentary democracy that made Great Britain strong. Italy moved towards democracy slowly, and universal manhood suffrage was not established until 1912. Democratic government had only begun to take root when Mussolini came upon the scene. He proceeded to abolish everything that recalled the old parliamentary democracy.

Legislative and advisory powers were given to the Grand Council of the Fascist party. Parliament was so weakened that Mussolini could say truthfully that its members were merely soldiers responsive to his command. The Prime Minister, Mussolini himself, ceased to be responsible to Parliament and became the absolute ruler of Italy. Centralization of administration was introduced into every branch of the Italian state. Even villages and cities were brought under direct central control.

In 1934, Mussolini reorganized Parliament on a new basis. Representation was no longer by geographical districts, but by occupational groups. A law was passed ushering in the Italian Corporate State, organized on the basis of twenty-two corporations, each representing a separate branch of industry. The National Council of Corporations first met in 1934. Its membership of 823 was made up of the councils of the twenty-two corporations. In 1938 the Chamber of Deputies was abolished, and a year later it was replaced by the National Chamber of Fasces and Corporations.

In 1938, under pressure from the German *Fuehrer*, Adolf Hitler, Italy embarked upon an anti-Jewish policy. Laws were passed which compelled the deportation of all foreign Jews, closed all state schools to Jewish teachers and pupils, dismissed Jews from the military services, and sharply limited their business privileges.

The old system of electing municipal officials was abolished everywhere except in Rome and Naples. Every city and town was placed under the control of a *podesta*, whose powers were something like those of a city manager, and who was appointed by the central government. The central government also appointed a governor for Rome, and a royal commissioner for Naples.

The Road to War. After 1935, Italy devoted much of its strength to the development of military power. The national life was organized on a wartime basis. In 1935 Italy seized Ethiopia, and in 1936 the Rome-Berlin Axis between Italy and Germany was born. Along with Germany, Italy aided the Spanish rebels under General Francisco Franco to win the Spanish civil war.

In 1939, Italian troops moved into Albania and took control of the country.

Italy and World War II. On the eve of the war between Germany and the Allies, Italy had 750,000 men under arms. But Italy did not enter the war until June 10, 1940, when the defeat of France seemed certain.

Fourteen days after Italy's entrance into the war, France was forced to sue for peace. Italy gained a strip of territory along the French border.

On October 27, 1940, Italy invaded Greece. The Greeks defended themselves well, and were not subdued until German troops came to Italy's aid. Both Yugoslavia and Greece were occupied by May, 1941.

Downfall of Mussolini. The tide of war slowly turned against Italy, and by 1943 the country's entire African

empire had been lost. Mussolini was forced to resign as premier, but he was rescued by German troops and became head of a puppet government in northern Italy. Sicily fell to the Allies. On September 8, 1943, the Italian Government surrendered unconditionally, and southern Italy, Corsica, and Sardinia were overrun. Allied troops took Rome in 1944, and northern Italy in April, 1945. Mussolini, twelve members of his cabinet, and five other persons, including his mistress, were shot by partisans in a village on Lake Como as they attempted to escape into Switzerland.

Postwar Problems. In September, 1945, the first free assembly of Italian representatives in twenty years was opened. Members of the assembly were nominated by Premier Ferruccio Parri's government from names submitted by the major political parties, from former anti-Fascist senators and deputies, and from members of labor, cultural, and ex-servicemen associations. General elections were set for 1946. King Victor Emmanuel, in 1946, gave up his throne to his son, Prince Humbert, in the hope that the Italian people might vote to continue the monarchy if they could have a new king. But the people remembered that the monarchy had served the dictator Mussolini, whom they blamed for Italy's misfortunes. In May, 1946, they voted to make their country a republic.

Acme

National Emblem of the Republic of Italy

The Allied Control Commission continued to dominate every aspect of Italy's political and economic life. The country's foreign policy, finances, and armed forces were under Allied supervision. Completely in the dark about their future, the Italian people could not develop a stable government or a stable economy. Right- and left-wing political groups were in constant conflict. A separatist movement began in Sicily and the criminal secret society known as the Mafia was revived in the south. Italian Communists tried to gain control of the government. Lawlessness was widespread.

Progress. But if the new republic faced problems, Italy had also made important gains. The secret police of Fascist days were gone. Freedom of the press was re-established. Papers of all shades of political opinion began to appear.

In 1947 the republic adopted a new constitution and held its first free election. Enrico de Nicola became the first president. A peace treaty was signed, and Allied troops were withdrawn from Italy. Italy lost such overseas possessions as Libya, Eritrea, Ethiopia, and the Dodecanese Islands. Italian Somaliland was made a United Nations trust territory for ten years and placed under Italian administration.

Italy became a member of the North Atlantic Treaty Organization, when it was created in 1949, and joined the Western Powers in their fight against Communism. In 1952, the Western Powers canceled the military clauses in the Italian peace treaty, which limited the country's armament program to domestic needs.

R.PEA.

Related Subjects. The reader is also referred to:

BIOGRAPHY

See the BIOGRAPHY section of the READING AND STUDY GUIDE

CHIEF PRODUCTS

Grape	Marble	Olive Oil	Silk
Macaroni	Olive	Rayon	Wine

DIVISIONS

Latium	Papal States	Sicilies, Kingdom of the Two
Lombardy	Piedmont	
Monaco	Sardinia, Kingdom of	Tuscany

HISTORY

Austria (History and Government)	Guelphs and Ghibellines
Axis	Holy Roman Empire
Black Shirt	Italian Somaliland
Camorra	Italo-Ethiopian War
Charlemagne	Libya
Crown (Iron Crown of Lombardy)	Pope
Fascism	Revolution of 1848
Flag (color plate [Flags of Europe])	Seven Weeks' War
	Theodoric
	Triple Alliance
	Vatican City

ISLANDS

Capri	Monte Cristo	Rhodes	Sicily
Elba	Patmos	Sardinia	

OTHER PHYSICAL FEATURES

Adige	Garda, Lake	Pontine Marshes
Albano, Lake	Genoa, Gulf of	Po River
Alps	Isonzo River	Saint Bernard, Great and Saint Bernard, Little
Apennines	Lugano, Lake	
Arno River	Maggiore, Lake	
Avernus, Lake	Matterhorn	Taranto, Gulf of
Brenner Pass	Messina, Strait of	Tiber
Como, Lake	Mont Blanc	Tyrol
Dolomites	Monte Rosa	Vesuvius
Etna, or Aetna	Nemi, Lake	Volturno

UNCLASSIFIED

Borghese	Italian Language
Dress (Italy; Renaissance to the End of the 16th Century; color plates, Gothic and Renaissance)	Italian Literature
	Pitti Palace
	Rome, University of
	San Marino
Food (Favorite National Foods; Special Foods of Many Lands)	Sculpture (Italy)
	Sistine Chapel
	Stefani
Furniture (Renaissance)	Uffizi Palace

Questions

What volcano in Italy is world-famous? Which known eruption was its worst?

What is the chief value of Italy's rivers?

How do Italians farm the steep Alpine slopes?

Which region in Italy leads in the number of cities?

How does Italy differ in natural resources from most mountainous countries?

Why are Italians not able to make use of all their fertile soil?

Why does much of Italy need irrigation, even though the yearly rainfall is ample?

In what food crop does Italy lead the world? What is the chief grain raised in Italy? Why?

What is "three-storied farming"? Why is it used?

Why are goats more common than cows in Italy?

For what products is the city of Leghorn best known?

For what famous structure is the city of Pisa noted?

How does Italy's contribution to art compare with that of other countries?

What were the city states? Why wasn't the period of the city states a prosperous time for Italy?

How did Napoleon's conquest of Italy really benefit the country?

How was each of the following important in Italian history: (a) Cavour (b) Mazzini (c) Garibaldi?

What part did Italy play in World War I?

How did Mussolini get control of Italy?

What changes did he make in the government of Italy?

What country did Italy conquer in 1935?

What territories did Italy conquer in World War II?

In what ways was Italy better off after than before World War II?

ITASCA, *eye TAS kah*, **LAKE.** See MISSISSIPPI RIVER.

ITCH is a condition resulting from irritation of the nerve endings in the skin. It is a symptom which may be due to irritating substances on the skin, diseases of the skin, or general diseases such as allergies, diabetes, and vitamin deficiencies. Itching is often a result of diseases, or infections, such as "barber's itch," which affects the skin where the beard grows, and "athlete's foot," which occurs on the toes and feet. Both come from infection by a fungus, and may also affect the scalp and other parts of the skin and deeper tissues. They can be prevented by cleanliness and sanitary conditions.

Another cause of severe itching is the disease called *scabies*. It is caused by a mite which burrows under the skin to lay its eggs. Scabies causes intense itching and breaking out of the skin. Scabies should be treated by a competent physician. All clothing and bedding of the patient should be disinfected.

H.R.V.

See also ATHLETE'S FOOT; DISEASE, PARASITIC; RINGWORM; SCABIES.

ITHACA is one of the seven islands of the Ionian Sea. It is believed to have been the birthplace of Odysseus, known also as Ulysses. He was the king of Ithaca and the hero of Homer's *Odyssey*.

S.M.S.

ITO, *EE toh*, **HIROBUMI, MARQUIS** (1841-1909), was a Japanese statesman who played one of the most important parts in making Japan a world power. He left Japan in his youth to study in England at a time when it was still illegal for Japanese to leave their country. Later he made several visits to Europe and the United States. He used the knowledge he gained on these trips to aid in making Japan a modern country.

Ito became premier in 1886 and held the office four times. He was mainly responsible for the drafting of the 1889 constitution and for the formation of Japan's imperialist policy. He was foreign minister during the Chinese-Japanese War of 1894 and 1895. Later he governed Korea. Ito was assassinated by a Korean in the Manchurian town of Harbin.

H.F.MACN.

ITURBI, *ee TOOR bee*, **JOSÉ** (1895-), is a pianist and conductor. He was born in Valencia, Spain, and first studied piano at the conservatory there. Later he studied in Paris, and was head of the piano department of the Geneva (Switzerland) Conservatory from 1919 to 1920.

Iturbi toured in Europe for a number of years. He made his American debut in 1929, and played with several major symphony orchestras. Critics praised the assurance and fire of his playing. He began conducting in 1933, and in 1936 was named conductor of the Rochester (N.Y.) Philharmonic Orchestra. Iturbi's conducting has been praised for his insight into music, but he has sometimes been criticized for excess showmanship.

Brown Bros.

José Iturbi, whose skill on the piano made him famous

Iturbi appeared in a number of motion pictures. In one he played with his sister, Ampar, who is also a pianist.

G.B.B.

ITURBIDE, *EE toor BEE thay*, **AGUSTÍN DE** (1783-1824), was Emperor of Mexico for ten months. He was born in Valladolid (now Morelia). Iturbide originated the "Plan of Iguala," which proposed that Mexico become an independent kingdom under a Spanish Bourbon prince. In 1820 a rebellion broke out, and he joined the royalist forces. He showed so much military ability that he was given command of the northern army.

The Plan of Iguala aroused much opposition among the Mexican people, but Iturbide quickly was able to overcome this opposition. In May, 1822, he was proclaimed Emperor Agustín I of Mexico. The Mexican Congress made the title hereditary in his family. But soon a new rebellion broke out which Iturbide was not able to put down. He was forced to give up his title the following March. He was allowed to go to Europe with a generous pension, on condition that he never return to Mexico. But a year later he tried to come back and fight once more for his throne. He was soon arrested and shot.

T.R.Y.

Brown Bros.

Agustín de Iturbide, a Mexican who made himself Emperor of Mexico

See also MEXICO (History).

IVAN, *ee VAHN*, is the name of several rulers of Russia. The most noted were Ivan III and Ivan IV.

Ivan III (1440-1505), GRAND DUKE OF MUSCOVY, was one of the founders of the Russian state. His reign (1462-1505) saw a great expansion of Muscovite territory and its final freedom in 1480 from rule by the Tartars. He also began diplomatic relations with European and eastern rulers. The German Emperor offered him a crown which he refused. He later took the title of Autocrat of All Russia. Ivan married Sophia, niece of the last Byzantine emperor, and added the Byzantine double eagle to the Russian coat of arms. Italian and Greek architects and artists came to Moscow with Sophia. They built many churches and palaces, and the walls and towers of the Kremlin.

Ivan IV, the Terrible (1530-1584) was the first *czar* of Russia. He took the title at his coronation in 1547. He earned the name *Grozny*, which means *the Dread* or *the Terrible*, first for the terror he inspired in war, and later for the ruthlessness with which he destroyed the fortunes and the power of the great nobles and princes. During his reign, he reorganized the central and local governments. In 1550 he called a National Assembly (*Zemski Sobor*), and revised the code of laws. Ivan fought many wars which increased Russian territories but wore out the country and made the condition of the peasants worse. English explorers discovered the northern sea route to Russia in 1553 and established trade relations with Russia. In 1581 Russia began its conquests and expansion in Siberia by the Cossack armies. H.H.F.

Ivan IV, the Terrible, was the first Russian czar.

IVAN V (1666-1696). See PETER I, THE GREAT.

IVANS, WALTER S., JR. See GLIDER (Glider Records).

IVES, CHARLES E. (1874-), is an American composer of symphonies, chorus and orchestral works, songs, and chamber music. He often used rhythmic schemes which interpreters found difficult to perform. Ives received the Pulitzer prize in 1947 for a symphony he had written in 1911. See PULITZER PRIZES.

Ives was born in Danbury, Conn. He was in the insurance business until he retired in 1930. But during these years, he was a church organist and a composer.

IVES, FREDERICK EUGENE (1856-1937). See INVENTION (Famous Inventions and Their Inventors).

IVES, JAMES MERRITT. See CURRIER AND IVES.

IVORY. The tusks of elephants and certain other animals are made of the hard, creamy-white substance called *ivory*. Elephants produce the best ivory. It is hard but bends without breaking and is easy to cut. Ivory has a fine texture which takes a high polish.

Sources of Supply. The best ivory comes from Africa. African elephants have larger tusks than the elephants of India, but Indian ivory is also sold. Great quantities of ivory come from Siberia. Here large animals, called mammoths and mastodons, once lived (see MAMMOTH; MASTODON). Today their tusks are dug from the frozen ground where they have been preserved for thousands of years. This ivory, known as dead ivory, is of poorer quality than the live ivory. But since live ivory is scarce, dead ivory helps to supply the market.

Poorer quality ivory comes from the tusks, horns, and teeth of the hippopotamus, walrus, and narwhal. Imitation ivory is produced from the nut of the ivory palm, as well as from celluloid and certain other plastics.

Uses of Ivory. A great number of articles are made from ivory. Among them are billiard balls, piano keys, chessmen, knife handles, combs, toilet articles, and ornaments. See also IVORY BLACK.

Ivory Carving. Men carved ivory long before history was written. Beautiful examples of very early carvings have been found in the caves of Dordogne, in the south of France. Similar objects were found in Switzerland among the remains of the ancient lake dwellers (see LAKE DWELLING). The tombs of ancient Egypt have yielded many fine ivory carvings. Ivory objects were also found in the ruins of Assyria and Babylonia.

Ivory was an important material for Greek sculpture. The sculptor made a foundation of wood for the statue. The wood was covered with thin layers of ivory for the face, hands, and other parts. The drapery, hair, and the rest of the statue were covered with gold. A famous example of such sculpture once stood in the Parthenon, at Athens. This was the statue of the goddess Athene by Phidias. His giant statue of Zeus at Olympia was listed as one of the Seven Wonders of the World.

For centuries India has produced ivory carvings of amazing skill. The ivory workers of China and Japan are also noted for their ability. S.M.S.

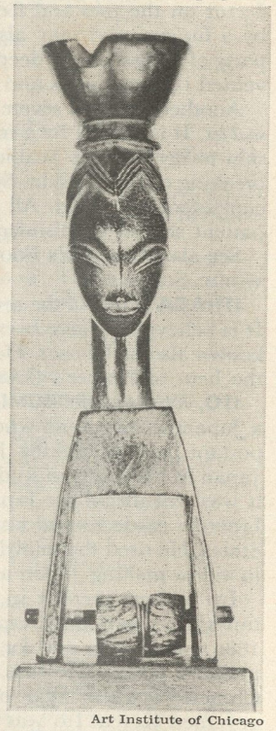
IVORY, VEGETABLE. See IVORY PALM.

IVORY BLACK is a black pigment or coloring matter made by heating waste ivory dust and chips. The term is also used for fine boneblack. Ivory black is used in painting. See also BONEBLACK. T.M.

IVORY COAST is a French colony in West Africa. It has a coast line of 380 miles and an area of 184,174 square miles. (See ALGERIA [colored map].) The population is about 2,065,000, including 5,000 Europeans. France actively took over this region in 1882. Coconuts and rubber are gathered, and some mahogany is cut. Gold is found on the Comoe and Bia rivers. Bananas, pineapples, groundnuts, corn, cotton, rice, and cocoa are grown. Coffee is the chief export.

Principal towns, all near the coast, include Grand Lahou, Grand Bassam, Assinie, Sassandra, and Abidjan, the capital (pop. about 46,000). Kong and Sakala are in the interior.

The ports are visited by French and British ships. There are government and mission schools. Telegraph and telephone lines connect the principal towns. R.PEA.



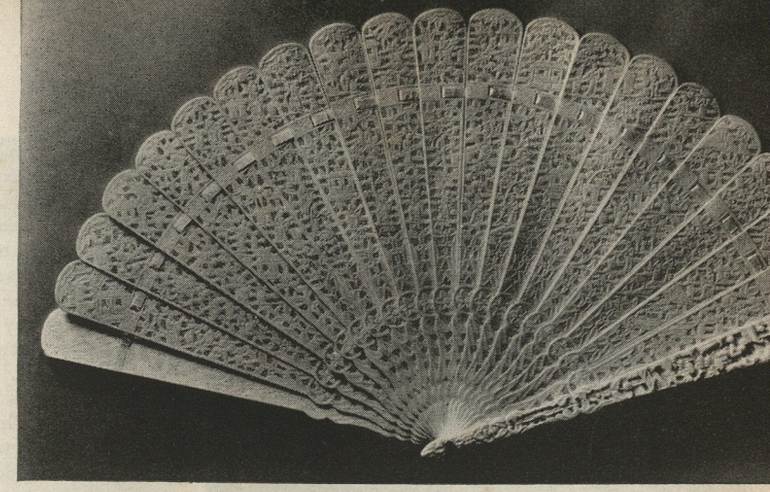
Art Institute of Chicago

A Carving by Natives of West Africa's Ivory Coast

IVORY PALM. The seeds of this handsome South American tree are an important substitute for ivory. They are widely used to make buttons, chessmen, and small ornaments. The tree is also known as the *ivory-nut palm*. It grows very slowly to a height of twenty to forty feet. The gorgeous large leaves shoot out like green ostrich plumes.

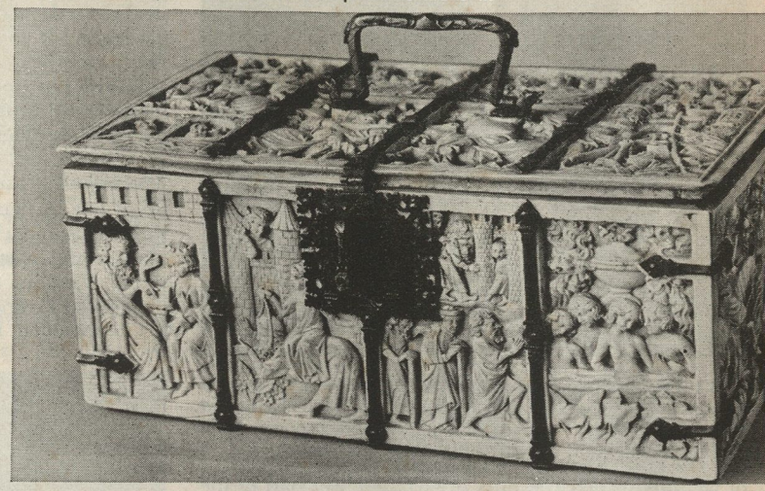
Fragrant white blossoms grow at the base of the lowest leaves. Later a large, rough brown bur appears there. Within the bur are sixty to ninety nuts, the size

An Ivory Statuette of Buddhist saints carved during the 1700's



This Delicate and Beautiful Ivory Fan is an excellent example of Chinese car Many months of patient work were required to make it.

This Virgin and Child in Ivory was carved in Flanders in the 1400's.



The Legend of Aristotle and the Fountain of Youth is carved on the front of delicate ivory casket. It was made in France 600 years ago.

The Romans Were Skilled Ivory Carvers. This model of a foot in a sandal, done about 2,000 years ago, has remarkable detail.

Photos: Chicago Natural History Museum; Metropolitan Museum

Christ and Several Saints are pictured on ivory plaque carved in Austria in about 970.

Bureau of Plant Industry, U.S.D.A.

The Ivory Palm of South America looks like a tall slender pineapple. Hanging from the right of the trunk is the bur of ivory nuts. The white nuts become very hard when they are dried, and are used to make buttons and similar products.

of walnuts. When the nuts ripen, the lower part of the bur splits open, letting the *negritos*, as they are often called, fall to the ground. The kernel of the nut is soft, juicy, and good to eat when it is ripe. But after it is dried, it becomes very hard and white. It looks so much like ivory that it is called *vegetable ivory*.

Vegetable ivory absorbs dyes easily and takes on a high permanent polish. It is also easy to carve. Ivory nuts are shipped in large quantities to factories for making buttons. I.M.J.

See also BUTTON.

Classification. The ivory palm belongs to the family *Palmae*. Its botanical name is *Phytelephas macrocarpa*.

IVRY, *EE VREE*, **BATTLE OF.** See HENRY (IV, France).

IVY, *I vih*, is any one of a large number of creeping or climbing vines. These vines have different botanical names, and the word *ivy*, as commonly used, does not belong to any one plant. Instead it may apply to any vine which climbs, but particularly to those which are ornamental.

Common, or English, Ivy. English ivy is the plant that makes such an attractive picture as it climbs over walls and tree trunks in England. Its waxy leaves have five points, or angles. They are dark green in summer, and turn bright scarlet in the fall. The English ivy also bears small inconspicuous flowers. This ivy can cling to smooth surfaces with the fine air roots on its stems. English ivy does not grow well in the bright sun of American winters. In suitable locations, however, it can be grown as far north as Ontario. It makes an excellent covering for buildings.

Boston, or Japanese, Ivy. Boston ivy is the climbing vine that covers the shady sides of buildings like a lovely green carpet. It is frequently found in New England and other parts of the eastern United States. The covering is made of many overlapping leaves, each with three points. This plant belongs to the same genus as the Virginia creeper.

Ground Ivy is also called *gill-over-the-ground*. It was brought to North America from Europe. This trailing plant has creeping stems that form thick masses wherever they get a foothold. Its leaves are rounded like a kidney, and its tube-shaped flowers are purple or blue. The ground ivy was formerly used in making ale and cough medicine. It was also popular with some landscape gardeners. It is now usually a troublesome weed in North America.

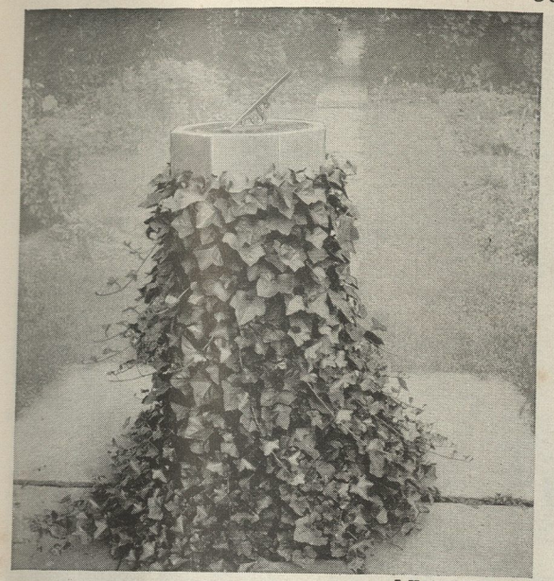
Poison Ivy and Virginia Creeper. These two plants look somewhat the same, though they belong to different families. They are both American vines, and often grow in the same locality. It is easy to confuse the two. The leaves of the Virginia creeper, however, are made up of five leaflets, while those of poison ivy have only three. Poison ivy leaves give off an oil that causes itching and painful blisters on the skin of persons who touch them. Virginia creeper is harmless. J.J.L.

See also POISON IVY; VIRGINIA CREEPER.

Classification. English ivy belongs to the ginseng family, *Araliaceae*. Its botanical name is *Hedera helix*. Boston ivy belongs to the vine family *Vitaceae*. Its botanical name is *Ampelopsis tricuspidata*. Ground ivy belongs to the mint family, *Menthaceae*. Its botanical name is *Nepeta glechoma*.

J. Horace McFarland

This Ivy Plant Has Long Erect Stems with silvery edges on the mottled green leaves. It is called "Argentea varigata."



J. Horace McFarland

English, or Common, Ivy Adds Beauty to Bare Walls of houses, to stone fences, and to many other structures. Here the base of a garden sundial is covered with the thick ivy leaves.

J. Horace McFarland

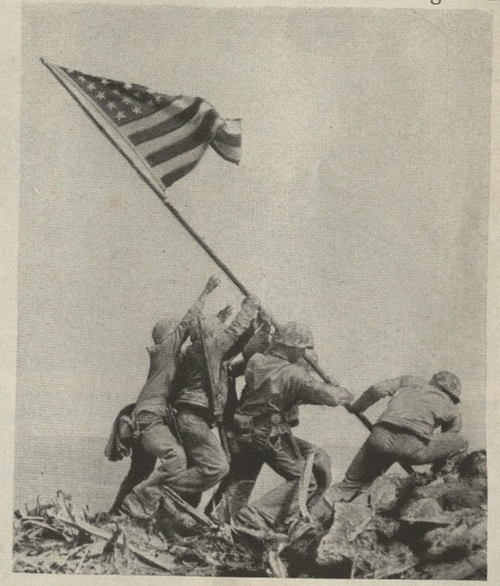
Some Types of Ivy Grow Well Indoors. This potted plant of Marion Beauty ivy makes a cheery green spot in the home.

IWO JIMA, *EE woh JEE mah*, is one of the southern Volcano Islands. More than 5,000 men of the Third, Fourth, and Fifth United States Marine divisions gave their lives to capture its eight square miles from the Japanese in February and March, 1945. The capture of the island was of great help to the American forces in the last stages of the war against Japan. Fighter planes used fields on the island to protect bombers flying to Japan and to make low-level attacks on targets in Japan. Iwo Jima fields were also useful as emergency landing fields for the giant B-29 bombers flying between Japan and their Marianas bases.

Iwo Jima is about five miles long and nearly two miles wide at its widest point. It is shaped rather like the continent of South America. The island is of volcanic origin. At the south end of the island is the cone of Mount Surabachi, a volcano.

Iwo Jima means "Sulfur Island" in Japanese, and there is a sulfur pit on the west side of the island. About 400 Japanese lived on the island and mined sulfur before World War II. Except for Mount Surabachi, the island is rather flat. It is large enough for three airstrips. The soil is of gray volcanic ash, and it was soft enough for the Japanese defending the island to dig extensive underground fortifications.

The island supports gardens, but has no natural water. All water except that which can be caught during rains must be brought in from other places or distilled from sea water.

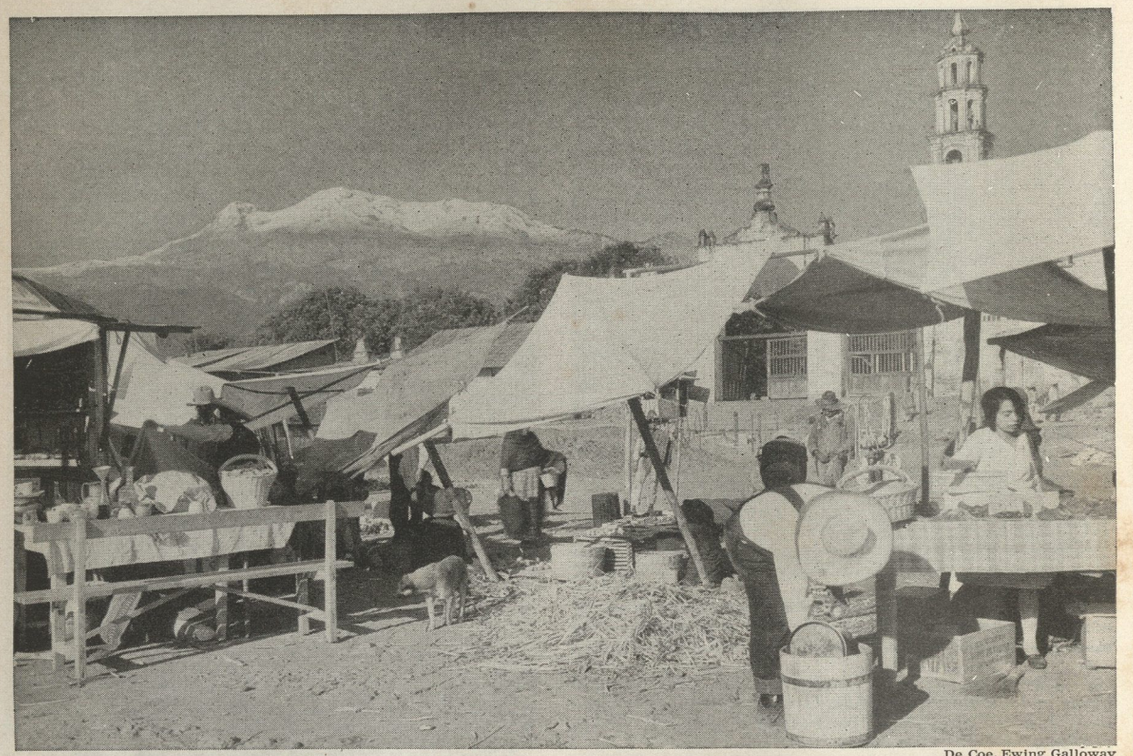


Acme

The Flag Raising on Iwo Jima is considered the best picture of World War II. It won a Pulitzer prize and was used on posters for war-loan drives. Only three of the men who raised the flag on Mount Surabachi left the island alive.

There is no harbor for large ships but small boats may land on the beaches on the southeast and southwest coasts. Kita Iwo Jima (North Sulfur Island) and Minami Iwo Jima (South Sulfur Island) are two volcanic cones a few miles to the north and south of Iwo Jima. They are not inhabited. R.W.MU.

IXTACIHUATL, *EES tah SEE wah t'l*, or **IZTACCIHUATL,** *EES tak SEE wah t'l* (17,343 feet), is an inactive volcano about thirty-five miles southeast of Mexico City. Ixtacihuatl means *white woman* in the Aztec language. The volcano was so named because its three snow-covered peaks resemble the head, breasts, and feet of a sleeping woman. Popocatepetl (17,876 feet) is another volcano eleven miles south of Ixtacihuatl, which occasionally sends up a spiral of steam, but it has not erupted any lava for a long time. These two mountains may be seen from Mexico City. The people there like to



De Coe, Ewing Galloway

Ixtacihuatl Mountain rises in the background of a small village market in Amecameca, Mex. This village is near the nation's capital, Mexico City. The mountain is beautiful at sunset, when violet shadows color the glistening snow.

sit on the flat roofs of their houses and enjoy the beauty of the white peaks against their background of deep blue sky. M.U.

IZAAK WALTON LEAGUE OF AMERICA is an organization of conservationists in the United States. The League is interested in the whole problem of conservation, but its special concern is to preserve and restore a wholesome outdoor environment. It seeks to protect the interests not only of hunters and fishermen, but also of all lovers of the outdoors.

The League was organized in Chicago in 1922. It has about 500 local chapters, scattered throughout the country. The League is an independent, nonprofit organization, supported by the dues of individual members and by gifts and bequests. National headquarters are in Chicago. The platform of the Izaak Walton League is as follows:

Prevent new pollution and get rid of existing pollution to safeguard health and aquatic life.

Protect and extend our forests and grasslands.

Prevent unjustifiable drainage and high dams, and restore unwisely drained areas.

Stop the sale of wild game and game fish.

Encourage production of wildlife by safeguarding natural conditions and restoring deficient environment.

Obtain nonpolitical administration of conservation departments.

Establish natural resource and wildlife courses in colleges as a basis for comprehensive scientific land and water management and for intelligent teaching of conservation in public schools.

Support land use and tax policies encouraging adequate forests, wildlife, and soil protection.

Oppose granting any special rights or privileges on Federal lands superior to those of the Government or general public, on the ground that Federal lands belong to all the people and their scenic, aesthetic, recreational and wildlife values are important public resources.

Protect our national parks, national forests, and public waters from commercial developments or uses incompatible with the public interest, and preserve intact areas of primitive country as monuments to the rugged beauty and solitude of the natural wilderness. K.A.R.

See also WALTON, IZAAK.

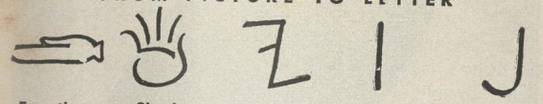
IZMIR, *iz MEER.* See SMYRNA.

IZZARD, *IZ erd.* See Z (the letter).

THE WORLD BOOK ENCYCLOPEDIA

Jj is the tenth letter of our alphabet. It was one of the last letters to be added to the alphabet, since it did not appear until the Middle Ages. J came from the letter I, which itself came from the Phoenician letter *yod*. The letter I was used at first to represent both vowel and consonant sounds. The vowel sounds were the long I as in the word *pine*, and the short I as in the word *pit*. The consonant sound at first was the sound of

FROM PICTURE TO LETTER



Egyptian 3000 B.C.	Sinai 1850 B.C.	Phoenician 1200 B.C.	Greek 600 B.C.	Middle Ages A.D. 1600

Y in the word *young*. Later, it was changed to represent the sound of J as in *joy*. During the 1600's, the letter I at the beginning or end of a word often was written with a tail. This form came to be a symbol for the consonant J. The short form of I was continued in use for the vowel. See also ALPHABET; PRONUNCIATION. E.F.D.

JABIR, or **GEBER.** See GEBER.

JABIRU, *JAB ih roo,* is a stork which lives in South America. It is common in the tropics, particularly in Brazil. The jabiru is about five feet long, with a wingspread of about seven feet. It has a huge bill a foot long. The bill is extremely thick at the base. The jabiru's plummage is pure white. The bill and legs, as well as the head and neck, are all black, except for a reddish ring of skin around the lower neck. This ring can be stretched out to form a pouch when the bird is excited. Jabirus feed on frogs, fishes, and other water animals.

The closely related wood ibis, which is common along the Gulf Coast from Florida to Texas, is sometimes called a jabiru. There are other kinds of jabiru in Australia, Asia, and Africa. See also STORK. A.M.BA.

Classification. The South American jabiru is *Jabiro mycteria.* It belongs to the family *Ciconiidae.*

JABOT, *zhah BO.* See DRESS (Eighteenth Century).

JAÇANA, *zhah sah NAH,* is a small wading bird of the tropics, with remarkably long toes and nails. It is related to the plover, and resembles the gallinule in appearance and habits. The long toes permit the jaçana to run easily over the floating leaves of large water plants, when it searches for food.

An Oriental jaçana, called the *surgeon bird,* has a long tail like a pheasant's. This bird is brownish above and purplish below, and has a white head and wings. Asiatic artists delight in painting this long-tailed jaçana.

An American jaçana lives in the tropics and as far north as Texas. It has purplish-chestnut feathers. In the bend of each wing is a strong spur, which it uses as a weapon. See illustration on following page; also PLOVER. A.M.BA.

Classification. Jaçanas belong to the family *Jacanidae.* The American species is *Jaçana spinosa gymnostoma.*

JACARANDA, *JACK ah RAN dah,* is a beautiful flowering tree native to Brazil. It is widely used for planting along streets in Florida, southern California, and other warm parts of the United States. The blue or violet-colored flowers grow in clusters. The leaves are finely cut, like ferns. The jacaranda sometimes grows as a shrub. It is grown from cuttings.

Classification. The jacaranda most commonly grown is *Jacaranda ovalifolia* (sometimes *J. mimosaefolia*). There are about fifty other species. Jacarandas belong to the family *Bignoniaceae,* which also includes catalpas and trumpet creepers.

JACK. See FLAG (Other Names for Flags).

Santa Catalina Island Co.

The Comic-looking Jabiru wades in the water and swamps of South America and gobbles up fish and frogs.

The Long Toes of the Jaçana make the bird look as though its feet belonged to a much larger bird.

JACKAL, *JACK awl*, is a kind of wild dog which lives in Asia, Africa, and Southeastern Europe. Its long and mournful cry is heard mostly at night. Arabs call the jackal "the howler."

The common jackal looks more like a fox than a dog. It is grayish-yellow or brown, and its bushy tail is about eight inches long. This animal is about 14 inches high from the shoulder to the ground. It is from two to two and a half feet long.

Jackals hunt in packs at night. It was once thought that jackals hunted prey for the lion and ate what the lion left. This is not true, but the animal does eat decaying flesh. Jackals have a bad smell. That is why they make poor pets, although they are easily tamed.

The black-backed jackal of Africa is prized for its fur, which is more attractive than that taken from common jackal. H.E.A.

Classification. Jackals belong to the family *Canidae*. The common jackal is *Canis Aureus;* the black-backed is *C. mesomelas*.

Ylla, Guillumette

The Sharp Nose and Long Bushy Tail of the Jackal mark it as a member of the widespread dog family. It is thought that many existing varieties of dogs are the result of crossbreeding of wolf dogs or wolves and the little wild jackal.

JACK BOOT. See SHOE.

JACK CADE'S REBELLION. See HENRY (VI, England).

JACKDAW is a common European bird of the crow family. It is dusky black in color, with a grayish fringe around the neck, and grows about fourteen inches long.

The Jackdaw Is an Amusing Thief. It picks up any small object that attracts it. An old story tells how one once stole a priest's ring and was cursed until he returned it.

The jackdaw is a very sociable bird and often stays in towns and villages. It builds its nest in towers or holes in trees. Jackdaws make intelligent pets, but are mischievous like crows. They carry away and conceal any small, bright object that attracts their attention. See also CROW. A.A.A. and L.A.HA.

Classification. The jackdaw belongs to the family *Corvidae*. Its scientific name is *Corvus monedula*.

JACK FROST is the imaginary sprite who was once believed to trace the beautiful patterns that frost makes on trees, windows, and other objects.

JACKHAMMER is a small compressed-air machine used for tearing up pavement. The compressed-air cylinder has a piston in the bottom which makes a strong steel chisel drive against the pavement with great force.

JACK-IN-THE-PULPIT is an American wild flower which grows in moist woodlands and thickets. It is found from Nova Scotia south to the Gulf states, and as far west as Minnesota. This plant is also called *Indian turnip*. It belongs to the arum family, and is a relative of the marsh calla.

Jack-in-the-pulpit has been well named. The part that looks like the preacher is the smooth slender stalk called the *spadix*. The tiny greenish-yellow flowers grow in a club-shaped spike on the upper part of this stalk. The "pulpit" is a leaflike growth which encloses the spadix like a trumpet. This part, the *spathe*, has a broad flap that extends up and over the spadix. It resembles the sounding board behind and over a pulpit. The spathe is pale green, striped with purple and brownish lines.

The oddly shaped flowers of this plant bloom from April to June. They produce clusters of smooth, red berries. The plant grows from a turniplike root filled with a hot burning juice. Sometimes this juice is used in homemade cough medicine. The root is tasteless when boiled, but is a nourishing food. P.C.S.

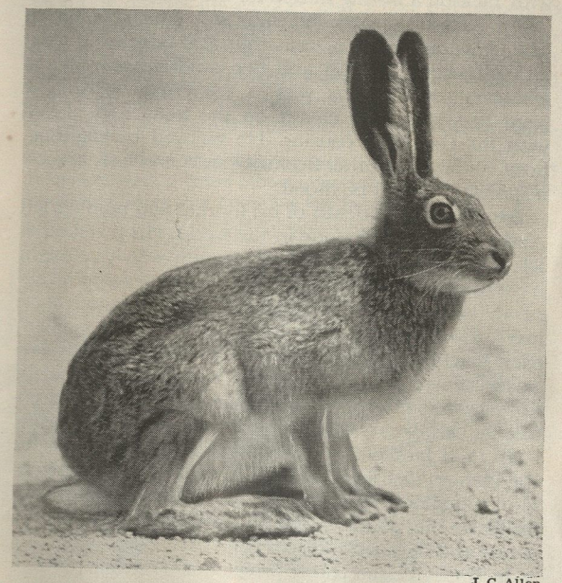
See also ARUM; FLOWER (color plate, Woodland Flowers).

Classification. Jack-in-the-pulpit belongs to the family *Araceae*. Its botanical name is *Arisaema triphyllum*.

JACK-O'-LANTERN, a mushroom. See MUSHROOM (color plate, Tree-Stump Mushrooms Thrive on Dead Wood).

JACK-O'-LANTERN is a name usually given to a hollowed-out pumpkin which has eyes, nose, and a mouth carved in one side. Jack-o'-lanterns are usually made on Halloween, and a candle or other light is placed inside the pumpkin. The term has also been given to the light that frequently shines from rotting stumps or logs in swampy land. Saint Elmo's Fire is sometimes called jack-o'-lantern.

JACK RABBIT. Several large hares of North America are called jack rabbits. They range over the plains from Canada south through Washington and Nebraska to Mexico. These rodents, or gnawing animals, have long ears and long hind legs. They increase very rapidly. Too many can be very harmful to crops and animal feed.



J. C. Allen

The Jack Rabbit of the western plains has long ears and powerful hind legs. The jack rabbit runs with long leaps and bounds. It is hard to see, when it squats, because its white underside is hidden and its body blends with the background.

The *white-tailed jack rabbit* is also called the *prairie hare*. It lives from the Mississippi River to California. In winter the animal's whole coat may turn white. Other jack rabbits do not change color in this way. They include white-sided and black-tailed groups. See HARE. S.P.Y.

Classification. Jack rabbits belong to the genus *Lepus*. The subgenus *Lepus* includes the white-tailed species, *campestris*, with its two subspecies *townsendi* and *sierrae*. The rest belong to the subgenus *Macrotolagus*.

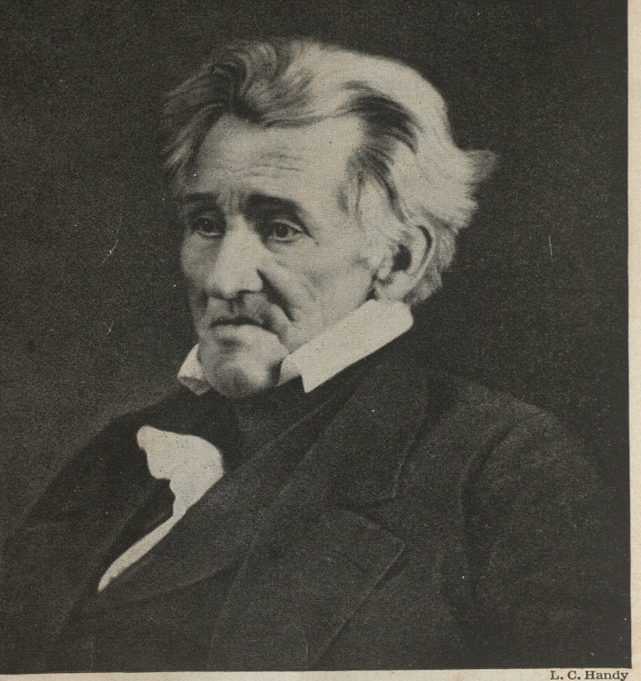
JACK SALMON. See PERCH.

JACKS AND JACKSTONES. Jackstones is a children's game played with small metal objects called *jacks*. The object of the game is to pick up the jacks from the ground while tossing and catching a ball or another jack. Jackstones with a ball is usually played with six jacks. Players take turns in trying to do a number of stunts without a miss. The player who completes the stunts first is the winner. Some of these stunts are called *Downs and Ups*, *Eggs in Basket*, *Upcast*, and *Downcast*. Jackstones without a ball is faster and more difficult. Ten jacks are usually used. Stunts are performed while one jack is being tossed in the air. Some of the stunts are *Over and Back*, *Scatters*, *Pigs in the Pen*, and *Sweeps*. Modern metal jacks have six points. An older game was played with knucklebones of sheep or other small animals. Both games probably came from *Pebble Jackstones*, which is still played in European countries. B.S.M.

JACKSCREW. See MACHINE (Six Simple Machines); SCREW.

JACKSON, Mich. (population 51,088), is a manufacturing city which lies in the heart of the rich farm lands of southern Michigan. Jackson is situated on both banks of the Grand River, about thirty-seven miles south of Lansing and about seventy miles west of Detroit. Most of the more than 150 factories of Jackson make automobile equipment, airplane wheels, or furniture. The city is also an important transportation center, located on the main line of the New York Central Railroad. On July 6, 1854, the Republican party was formed and named at a convention held in Jackson. Jackson has a city junior college. The state prison of southern Michigan is near the city. Illuminated cascades at Jackson attract summer visitors. The first permanent settlement was made in 1829, and the site was named for General Andrew Jackson. Jackson was incorporated as a city in 1857. It has a commission government, and is the seat of Jackson County. L.G.V.V.

JACKSON, Miss. (population 98,271), is the capital and largest city of its state. Jackson was founded in 1822 on the site of La Fleur's trading post on Pearl River. Today it is one of the most important transportation and manufacturing centers of Mississippi. The chief products of Jackson factories are crushed cottonseed, fertilizer, glass bottles, farm implements, work clothes, fluorescent lamps, furniture, and lumber products. The city is served by nine railroads, and by several bus lines, motor freight lines, and air lines. Six colleges, three for white students and three for Negroes, are located in Jackson. Near by are gas and oil fields. The city was named in honor of Andrew Jackson. It is the county seat of Hinds County. R.A.McL.



L. C. Handy

Andrew Jackson

7th PRESIDENT OF THE UNITED STATES, 1829-1837

JACKSON, ANDREW (1767-1845). The period which produced Andrew Jackson was a period of great men in American public life. The distinguished statesmen of that time included Daniel Webster, John Quincy Adams, Henry Clay, and John Calhoun. But Andrew Jackson stood out as the most striking personality of his time, even among these famous leaders. The years during which he was prominent in national political life are known as the Jacksonian era.

Jackson's administration was important for the things it accomplished. It was even more important for what it symbolized: the coming of nationalism and democracy in the United States. Andrew Jackson, in his own person, came to represent the rise of the new West to power and the triumph of the common man.

Jackson was far more than a symbol. Almost every important event of his administration bears the stamp of his mind and character. Jackson was a lawyer by profession, a fighter by choice, and a politician by force of circumstance. He founded the modern Democratic party, sponsored the spoils system in national politics, and vigorously asserted and maintained American nationalism. He also gave to the powers and duties of the Presidency a new interpretation which has had a lasting influence.

Early Life

Andrew Jackson was born March 15, 1767 near Waxhaw Creek, in Lancaster County, South Carolina. His father, Andrew Jackson, was a poor farmer of Scotch-Irish descent. He had emigrated from Ireland in 1765 and settled on Twelve-Mile Creek, near the present boundary of North and South Carolina. His wife, Elizabeth Hutchinson Jackson, came to America with him. She was a woman of courage and strong character.

Jackson's father never saw his son and namesake. He died in 1767, a few days before the future President was born.

Boyhood. The widow Jackson, with three children, went to live with her sister, Jane Crawford, whose farm was next to her own. Andrew spent his boyhood in this frontier environment. Before he was ten years old, the Revolutionary War began. The war made a lasting impression upon him. His mother died of prison fever, which she caught while nursing American soldiers held prisoners by the British. One of his brothers was killed in the war, and the other died of smallpox while he was being held a war prisoner. Andrew himself took an active part in the fighting. At the age of fourteen he was captured by a British raiding party. In the course of the raid, a British officer ordered Andrew to black his boots. The boy refused, and the officer struck him with his sword, cutting his arm to the bone. This experience left with Jackson a lasting hatred for the British.

But Jackson's early life was not altogether harsh. The Crawford's were a numerous and prosperous clan, and Elizabeth Jackson and her children were part of whatever society there was in the Waxhaw. Andrew went to school, did chores on the farm, and played with his Crawford cousins. He enjoyed cockfighting, horse racing, and other frontier sports, and had, in most respects, a normal boyhood.

Education. The death of his mother and brothers left Andrew practically alone in the world. His grandfather left him about three hundred pounds, which he might have used to set himself up in business or farming. Instead, he wasted it in gambling, especially on horse races. He attended school in a half-hearted manner, tried teaching school and in 1784 began to study law at Salisbury, North Carolina. The qualifications for lawyers were not high in the state at this time, and before he was twenty he had been admitted to the bar.

In 1788 Jackson was appointed public prosecutor for the western district of North Carolina. This was the region which now forms the state of Tennessee. He set out for Nashville, pausing long enough at Jonesboro to try a case and fight a duel — the first of many.

In Nashville the young prosecutor became a terror to evildoers. His official success brought him a large private practice, and soon he found himself a large landowner and substantial citizen. He also won a wife, Mrs.

Rachel Robards, who was the daughter of one of Tennessee's pioneer settlers.

Political and Public Activities

Politics and Business. From 1790 to 1796 Jackson was busy with a growing law practice, widespread land speculations, a business establishment, and occasional Indian fights. In 1796 he was chosen a member of the convention which adopted a constitution for the new state, and he has been given credit for proposing the state's name, Tennessee. In the same year he was elected, without opposition, as the state's one member in the House of Representatives. Here he distinguished himself by his strong opposition to President Washington.

In the House, Jackson's chief success was in getting the Federal Government to repay Tennessee for the money spent in fighting the Cherokee Indians. Before the end of Jackson's term in the House, he was elected United States Senator. He resigned from the Senate in the spring of 1798 and returned home to put his business affairs in order. He was appointed judge of the state supreme court, and for six years fulfilled the not very demanding duties of that office. Throughout these years Jackson was managing a large plantation, speculating in lands, conducting a store, and recovering his losses in storekeeping by fairly steady winnings on his racing stables. His hair-trigger temper and high sense of personal honor involved him in occasional duels, in one of which he killed his opponent and was himself wounded.

The Soldier. Jackson had been a United States Senator at thirty-one and a Judge at thirty-two, but he was in danger of becoming a failure at forty-five. The War of 1812 gave Jackson the great opportunity of his life. Ever since 1802 Jackson had been a major general of the Tennessee militia. When war broke out in 1812, he promptly offered his services and 2,500 militiamen to the President. In January, 1813, he was ordered to New Orleans. In March, while organizing his troops at Natchez, Miss., he suddenly received orders to disband his troops and send the men home.

Jackson was furious that no pay, rations, or transportation had been provided for the men, 800 miles from home. He defied the order and himself led his men back to Tennessee. "He's tough" said one of the soldiers of their commander. "Tough as Hickory" was the reply, and Jackson returned to Tennessee with the nickname by which he was thereafter to be known, "Old Hickory."

Young Andrew Was Courageous and Proud. When he refused to black a British officer's boots, the soldier struck Jackson with his sword and threw him into jail for refusing.

Jackson Won the Nickname of "Old Hickory" during the War of 1812. The tough mountaineers and frontier riflemen coined the name because of their leader's strength and energy.

Jackson stopped off only long enough to fight a bloody duel with Thomas Hart Benton. He next took command of a force of Tennessee volunteers in a campaign against the Creek Indians. He defeated the Creeks in one skirmish after another, and finally all but wiped them out in the battle of Horseshoe Bend, in Alabama. At Fort Jackson he dictated terms of peace to the tribesmen, and forced them to yield about 23,000,000 acres of their lands in Georgia and Alabama.

The Federal Government was happy to have found a man who not only fought but won victories, and now commissioned Jackson a major general in the regular army. A blow was expected against the lower Mississippi, and Jackson was assigned to command in the South. He asked permission to attack Pensacola, Fla. Florida was then Spanish territory, but the British were using Pensacola as a base of operations. When orders failed to arrive promptly, Jackson took the responsibility on himself and, in a whirlwind campaign, captured the town. The victory was important because it left him free to supervise the defense of New Orleans.

Jackson arrived at New Orleans on December 1, 1814, and found the city almost defenseless. In a frenzy of energy he inspired both army and civilians with something of his own enthusiasm, and sent urgent messages for badly needed reinforcements. Breastworks were soon constructed, trenches dug, and full preparations made against attack. Jackson proclaimed martial law and ruled the easygoing community with an iron hand. He put down a threatened mutiny and executed six of the mutineers. He also arrested a judge who attempted to resist martial law. When civil law was re-established, the court fined Jackson $1,000. Thirty years later Congress refunded the amount with interest.

Battle of New Orleans. Jackson's energy got results, and timely reinforcements from Kentucky and Tennessee brought his available forces to a little over 5,000. After several minor attacks in December, the British launched their grand assault at dawn of January 8, 1815. It was a foolhardy attempt—an attack in close columns against earthworks defended by artillery and riflemen whose aim was known to be deadly. The assault ended in a terrible defeat for the British. The British lost their three highest-ranking officers, some 2,000 other casualties, and the city of New Orleans. Jackson's losses were just thirteen killed.

The victory at New Orleans had no military importance, for it was fought two weeks after the treaty of peace had been signed. But it did have great political and psychological importance. It was the only major victory that American forces won on land during the War of 1812. It gave Americans a reason to congratulate themselves that they had finished the war in a blaze of glory. And it made Jackson a national hero.

Indian Campaigns. After receiving the thanks of Congress for his services, Jackson was appointed commander in chief of the southern division of the United States army. Trouble was brewing along the border between Georgia and Spanish Florida. Here fierce Seminole Indians, some of the Creeks who were still outraged by the Treaty of 1814, and groups of escaped slaves and vagabonds made raids into the American settlements north of the border. In 1817 Jackson was ordered to protect American settlers here.

In the following year he led an army against the Seminoles, defeated them, and pursued them into Spanish Florida. His seizure of Pensacola and his arrest and execution of two British subjects, Arbuthnot and Ambrister, who were accused of stirring up the Indians, caused great excitement both in the United States and in England. The British Foreign Minister wisely concluded that the two unfortunates had been "engaged in unauthorized practices" and washed his hands of them. In Congress, however, Jackson's whole campaign was severely criticized. "It was in the provinces that were laid the seeds of the ambitious projects that overturned the liberties of Rome," Henry Clay reminded his hearers. In the end Jackson was upheld by a decisive vote.

The Cabinet, too, was inclined to reprimand the daring commander, but in the end the arguments of John Quincy Adams, who hotly defended Jackson, were successful. The dispute with Spain was closed when Spain ceded Florida to the United States in 1819, and Jackson was appointed military governor of the new territory. He held the office for less than a year—long enough, however, to have one sharp conflict with the civil authorities there. People remember his term of office as governor of the Florida territory because the city of Jacksonville is named for him.

The Road to the Presidency. Jackson's military career was now at an end. His battles from this time on were to be political. A group of Tennessee politicians was already grooming him for the Presidency. In 1822 the Tennessee legislature endorsed him as a candidate. Two years later it formally placed him in nomination. In 1823 Jackson had again been chosen to the U.S. Senate, a post which he held for only two years.

All energies were bent now toward the election, and it was clear that the competition would be stiff. Secretary of State John Quincy Adams regarded himself as the logical person to follow Monroe. Henry Clay of Kentucky hoped to capture the West. William H. Crawford of Georgia put his faith in the South and New York, where his lieutenant, the clever Martin Van Buren, was earning the title of "Little Magician."

But nothing could withstand the tide of Jacksonian sentiment. When all the returns were in it was seen that Jackson had carried Pennsylvania, the Carolinas, and most of the West, with a total of 99 electoral votes. Adams, his nearest rival, had only 84 electoral votes.

Jackson Accepted the Help of Jean Lafitte at the Battle of New Orleans. Lafitte was a pirate, but he was loyal to America. He refused a large sum to join the British, and instead fought valiantly with Jackson's victorious troops.

Cheering Crowds Followed Jackson to the White House after his inauguration as President. Merchants, farmers, frontiersmen, and teachers joined the procession behind Jackson's horse as he rode from the Capitol to his new home.

Crawford was a poor third, and Clay was out of the race. But no candidate had a majority, and so the election went to the House of Representatives, where the voting was by states. Clay threw his support to Adams, who thus received the votes of thirteen states. Seven states voted for Jackson, and four for Crawford.

Adams promptly named Clay his new Secretary of State, and the enraged Jacksonians charged that there had been a "corrupt bargain" between Adams and Clay by which Jackson had been cheated out of the Presidency. Actually, however, there was no such bargain.

Jackson himself firmly believed this charge of a corrupt bargain, and he never forgave either Clay or Adams. He and his followers devoted themselves during the following years chiefly to embarrassing the luckless Adams. In this they were spectacularly successful. Adams had none of the arts of the politician, and was unable to compete with Jackson for popular favor.

In the election of 1828 Jackson received 56 per cent of the popular vote, and carried the electoral college by 178 to 83 for Adams. Not only the southern and western states, but Pennsylvania and most of New York as well voted for Jackson. "But," a distinguished historian of this period has written, "it was classes rather than sections that elected Jackson: the Southern hunters and backwoods farmers whom he had led to glory; the Northern democracy, tired of respectable gentlemanly promotions from Cabinet to White House. They cared little for politics, but much for personality, and they voted for Jackson because he was their sort of man . . . uneducated, intolerant, yet professing the immortal principles of Thomas Jefferson."

Administrations as President (1829-1837)

Jackson's inauguration was symbolic. It was the people's day. A contemporary described the scene as follows:

When the appointed hour came we saw the General and his company advancing up the Avenue, slow, very slow, so impeded was his march by the crowds thronging around him. Even from a distance he could be discerned from those who accompanied him, for he only was uncovered (the servant in the presence of his sovereign, the people). The south side of the Capitol was literally alive with the multitude who stood ready to receive the hero and the multitude who attended him. At the moment the General entered the portico and advanced to the table the shout that rent the air still resounds in my ears. When the speech was over, and the President made his parting bow, the barrier that had separated the people from him was broken down, and they rushed up the steps all eager to shake hands with him. It was with difficulty he made his way through the Capitol and down the hill to the gateway that opens on the Avenue. Here for a moment he was stopped. The living mass was impenetrable. After a while a passage was opened and he mounted his horse (for he had walked to the Capitol). Then such a cortege as followed him. Country men, farmers, gentlemen mounted and dismounted, boys, women and children, black and white, carriages, wagons, and carts all pursuing him to the President's house.

Jackson became President with a body of general principles rather than with a specific program. His own statement of principles was brief and to the point: "The Federal Constitution must be obeyed, state rights preserved, our national debt must be paid, direct taxes and loans avoided, and the Federal Union preserved. These are the objects I have in view, and regardless of all consequences will carry into effect." His Cabinet appointments caused some misgivings. Van Buren of New York, chosen as Secretary of State, was the only prominent man in the group.

The Spoils System. In his inaugural address, Jackson had promised reform in the national administration, "particularly the correction of those abuses that have brought the patronage of the Federal Government into conflict with the freedom of elections." It was evident

that he was determined to clear out incompetents. It soon became clear that opposition to Jackson seemed to him an indication of incompetence.

There was personal bitterness in all this. Just before Jackson's inauguration, his beloved wife Rachel had died. Her death had hardened his heart against all those who, for political purposes, had slandered her name. But there was more than personal bitterness, there was principle as well. "The duties of all public officers," Jackson stated in his first message to Congress, "are so plain and simple that men of intelligence may readily qualify themselves for their performance, and I cannot but believe that more is lost by long continuance of men in office than is generally to be gained by their experience."

In any event, Jackson determined to clean out the Old Guard and make way for his supporters. "To the victors belong the spoils," Marcy of New York said, and this sentence became the slogan of the new administration.

Yet the number of persons Jackson removed from office has been greatly exaggerated. Actually he dismissed only 919 officeholders out of a total of about ten thousand — or about one in eleven. Jackson did not "corrupt" the civil service. What he did was to introduce into the Federal administration the system which state politicians had already perfected in states like New York and Pennsylvania. Once introduced, it remained to worry the executive and weaken efficient administration.

Ladies' Hermitage Association

Rachel Robards Jackson lived to see her husband elected President, but died before he moved into the White House.

The Tariff and Nullification. Soon there was more important business than patronage to command Jackson's attention. In 1828, shortly before the end of Adams' administration, Congress had passed the so-called "tariff of abominations." (See ADAMS, JOHN QUINCY.) The entire agricultural South deeply resented this tariff, with its high duties on foreign manufactures. South Carolina, long the leading cotton state in the Union, was especially bitter against the tariff.

Vice-President Calhoun, South Carolina's most distinguished statesman, made himself the spokesman of opposition to the tariff. Calhoun failed to win his point by ordinary political means, and next proposed the doctrine of nullification, which was first formally elaborated in Calhoun's Exposition of 1828. Calhoun contended that sovereign states might nullify acts of Congress which were in violation of the Constitution. This principle was restated in Congress by Senator Robert Y. Hayne of South Carolina in the course of his great debate with Daniel Webster in 1830.

At this critical time, Jackson allied himself with Webster and the forces of union. At a Jefferson anniversary dinner, organized to celebrate the states-rights doctrine of the founder of the Democratic party, Jackson surprised and confounded Calhoun with his toast, "Our Federal Union — it must be preserved." Shortly thereafter he broke with Calhoun, whose chances at the Presidency then went glimmering.

In 1831 Jackson reorganized and strengthened his Cabinet. Van Buren was sent as Minister to England. Edward Livingston of Louisiana took over the State Department, Lewis Cass of Michigan the War Department, Louis McLane of Ohio the Treasury, and Roger B. Taney of Maryland the Attorney Generalship. The Cabinet had been transformed from one of the weakest into one of the strongest in our history.

In 1832 Congress passed yet another high-tariff measure. This time South Carolina acted. A special convention declared the new tariff null and void, and threatened to secede from the Union if efforts were made to collect duties at Charleston. Jackson was personally opposed to high tariffs, but he was not prepared to submit to nullification. He ordered troops to be concentrated at a convenient distance from Charleston, sent warships to Charleston Harbor, and solemnly warned South Carolinians not to resist the law. "The laws of the United States must be executed," he said. "I have no discretionary power on the subject; my duty is emphatically pronounced in the Constitution . . . Disunion by armed force is *treason.* Are you really ready to incur its guilt? If you are, on the heads of the instigators of the act be the dreadful consequences; on their heads be the dishonor, but on yours may fall the punishment."

Calhoun resigned the Vice-Presidency and was promptly elected to the Senate, where he eloquently defended the right of nullification and secession. But Congress, at the demand of Jackson, passed a Force Act authorizing him to use the army and navy to collect duties. At the same time, Henry Clay, the "great conciliator," pushed through a compromise tariff which went a long way toward appeasing the South Carolinians. South Carolina boldly nullified the Force Act, but withdrew her nullification of the tariff, and the crisis passed.

The Fight Against the Bank. The major issue of the stormy Jacksonian period was the fight over renewing the charter of the Bank of the United States. The first Bank of the United States had been chartered in 1791 for a period of twenty years. Its charter had been allowed

to lapse in 1811, but in 1816 a second Bank of the United States was chartered for another twenty years. It conducted its business affairs well, on the whole, but in a manner which was almost bound to offend the agricultural interests of the South and West.

Jackson, who himself belonged to the propertied class, was opposed to the Bank for political rather than for economic reasons. His own following — the "common people" — was hostile to the Bank. The Bank had meddled in politics, and the Bank's political champions, Clay and Webster, belonged to the opposition. These reasons were enough.

In his first message to Congress, Jackson made clear his hostility to the Bank. When the Bank's supporters unwisely decided to force the issue of recharter as a campaign issue of the 1832 election, the fight was on. Congress voted to recharter the Bank in 1832, and Jackson vetoed the bill, on the grounds both of constitutionality and of expediency. The constitutional issue — the power of the government to create such a bank — had appeared to be settled by the Supreme Court decision in McCulloch v. Maryland, but Jackson announced that he did not feel bound by that decision. He had sworn to defend the Constitution as he understood it, not as someone else understood it.

Jackson's Second Term. The presidential campaign of 1832 was fought on the bank issue. Jackson was renominated by the Democrats, and the opposition (now calling themselves Whigs), put up Henry Clay of Kentucky. The result was an overwhelming victory for "Old Hickory," who won 219 electoral votes to 49 for Clay and 18 for two minor candidates.

Jackson properly interpreted this victory as popular approval of his Bank policy. Carrying the war into "enemy" territory, he ordered his Secretary of the Treasury to remove government deposits from the Bank. This the Secretary refused to do, and Jackson dismissed him and appointed one who would. The withdrawal of the government's deposits practically ended the Bank's activities. It was converted, in 1836, into the Bank of the United States of Pennsylvania, and shortly thereafter went out of business.

The Surplus and the Specie Circular. The war on the Bank came during a period of financial speculation, the opening up of the West, and an upswing in foreign trade. The situation called for a wise and cautious investment policy, but Jackson's withdrawal of government funds from the Bank of the United States and his later deposit of these funds in about eighty "pet" banks encouraged rather than discouraged speculation.

Meantime high tariffs were bringing in more money than the government was spending. In 1835 the national debt was paid off, and the treasury showed a surplus of some $35,000,000. Congress generously provided that any surplus above $5,000,000 should be divided among the states as a loan, and about $28,000,000 was distributed in this way. The surplus, however, was in the "pet" banks, and these had to call in their own loans when they were suddenly called on for funds.

The tightening of credit came at the time of a financial crisis in Europe, which caused a fall in the price of cotton. Jackson was determined to protect the interest of the government, and issued a "specie circular" directing government agents to accept only gold and silver in payment for public lands. This circular caused consternation throughout the West, where much of the currency in circulation was in notes of wildcat banks. All these things, together with a general overexpansion of business and overinvestment in public improvements, created a panic just as Jackson was going out of office.

Indian and Foreign Affairs. One of the most urgent problems which confronted Jackson was what to do with the Indian tribes east of the Mississippi. Most of these tribes occupied land which had been guaranteed to them by treaty with the United States. Yet the average American — especially the frontiersman — thought it unbearable that much of the best farming land in the country should belong to Indians.

Jackson felt as frontiersmen did on this matter. He had little sympathy for the Indian, and felt sure that the Indian could not permanently remain in the East. From the beginning, Jackson favored a policy of removing the Indians to land west of the Mississippi.

Horace C. Hime

The "Hermitage," Home of Andrew Jackson. This stately colonial building, located a few miles outside Nashville, Tenn., has become an American shrine. No photograph of Jackson's birthplace exists. He himself was not sure where he was born.

The first issue came in connection with the Cherokee Indians in Georgia. Shortly after Jackson's inauguration, Georgia passed a law pushing the Cherokee out of the lands which they had held for generations and which had been guaranteed to them by treaty. The Cherokee appealed to the President for aid, but Jackson told them that he "had no power to oppose the exercise of sovereignty of any state over all who may be within its limits." This attitude was very different from his attitude toward South Carolina two years later. After long resistance, the Cherokee were forced out of their ancient hunting grounds and joined the other "civilized" tribes in the Indian Territory allotted to them in the West. See INDIAN TERRITORY.

The Sauk Indians of Illinois, too, resisted being driven from their lands, but were shattered in the miserable campaign called the Black Hawk War. The Seminole in Florida gave more trouble. Led by the brave chief Osceola, they resisted for years. They were finally defeated in 1842 at a cost of hundreds of lives and millions of dollars.

Only two events in foreign affairs during Jackson's administration deserve attention. The first was Van Buren's success in obtaining from Britain the right of American ships to direct an unrestricted trade with the British West Indies. The second occurred when Jackson, by threat of force, finally persuaded France to pay some long-outstanding "spoilation" claims dating from the Milan and Berlin decrees.

Slavery and Texas. Two states, Arkansas in 1836 and Michigan in 1837, were admitted to the Union during the Jackson administration. The admission of new states was closely related to the troublesome problems of slavery. A new era in the slavery quarrel had been begun when William Lloyd Garrison founded *The Liberator* in 1831. Thereafter the abolitionists gave the apologists for slavery no peace. In 1835 Texas began its war for independence. Americans believed that an independent Texas would soon be annexed to the United States, and that its vast area could then be divided into several states. How would this affect the balance between North and South, which had been carefully maintained since the uproar over the admission of Missouri? Anti-slavery forces opposed the admission of Texas as a state, or even the recognition of Texan independence. But a few days before Jackson retired from office, he named a chargé d'affaires to the Republic of Texas.

Later Years. On March 4, 1837, Jackson, following the example of George Washington, delivered a Farewell Address to his countrymen, warning them solemnly against sectionalism and disunion. He then retired to his home, The Hermitage, near Nashville. He died there on June 8, 1845, sure of his place in the affections of his people and of his fame in the history of the nation he had helped to build. H.S.C.

Mistress of the White House. Emily Donelson, niece of Rachel Jackson, served as hostess of the White House. She was the wife of Jackson's private secretary, and had four children during the time they lived in the Presidential mansion.

Rachel Robards Jackson (1767-1828) was the daughter of Colonel John Donelson, a pioneer settler of Tennessee. She was divorced by her first husband, Captain Lewis Robards, and married Andrew Jackson in 1791. It was later discovered that her husband's divorce decree, which had to come from a Virginia court, had not been granted. This misfortune required Jackson and his wife to go through a second legal marriage. Happenings of this kind were natural enough in a frontier country, but scandalmongers made great use of the story during the bitter political campaign of 1828.

Actually, Rachel Jackson was the victim of the most malicious attacks ever directed against a President's wife. She lived to see her husband elected, but died before he went to the White House to live. During President Jackson's administration, the mistress of the White House was Mrs. Jackson's niece, Mrs. Emily Donelson, whose husband was Jackson's private secretary.

Rachel Jackson was essentially a frontier woman and a homemaker. Andrew Jackson's unswerving devotion to his wife was one of his most striking and admirable qualities. The Jacksons had no children, but they adopted a nephew of Mrs. Jackson.

Related Subjects. The reader is also referred to:

Abolitionist
Adams, John Quincy
Bank of the United States
Calhoun, John C.
Clay, Henry
Force Bill
Kitchen Cabinet
Nullification
Spoils System
Tariff
Wildcat Bank

An Outline suitable for the life of President Jackson will be found with the article "President of the United States."

Questions

When and where did Jackson receive his nickname?
How did Jackson interpret his election in 1832?

What was Jackson's first public office? How well did he succeed in it?

What were Jackson's chief services as representative from Tennessee?

What different business activities did Jackson carry on while he was a judge?

What events early in the War of 1812 proved Jackson a good soldier?

Why was the outcome of the Battle of New Orleans really unimportant? What did Jackson's victory prove to the Americans?

Why was Jackson criticized for his campaigns against the Indians?

How did it happen that Jackson did not become President in 1824, even though he had more electoral votes than any other candidate?

What events of the election of 1824 made Jackson an enemy of Clay and Adams?

What class of people was responsible for Jackson's election in 1828? Why did these people favor Jackson?

What brief statement of principles did Jackson make?

What was the Spoils System? How many people did Jackson actually remove from office?

Why did Jackson oppose the Bank of the United States?

What were some of the causes of the panic that developed during Jackson's second term?

What problems concerning Indians arose while Jackson was President? How did he deal with the problems?

What foreign events of importance occurred while Jackson was President?

JACKSON, HELEN FISKE HUNT (1830-1885), was an American novelist and poet. She is best remembered for her book *Ramona*, in which she expressed her disapproval of the ill-treatment of the Indians by the United States Government. She had previously written on the subject in 1881 in her *A Century of Dishonor*. She gave a copy of this book to each member of Congress. Soon afterwards she was appointed special commissioner to investigate Indian affairs.

Chi. Hist. Soc.

Helen Hunt Jackson, American writer of the famous Indian novel, "Ramona"

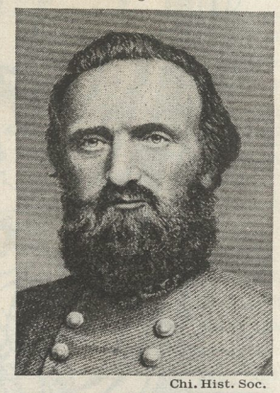
Ramona has been compared with *Uncle Tom's Cabin*, as a book written for a definite purpose. It was made into a successful motion picture in 1928.

Helen Jackson is also known for her children's stories and her poems.

The writer was born in Amherst, Mass. She was married to Major Edward B. Hunt, who died in 1863. She began to write for magazines in 1865, and published her works under the initials "H.H." In 1875, she went to Colorado Springs, Colo., for her health, and there met and married William S. Jackson. Her sympathy for the Indians was developed in Colorado. She was ill when she completed *Ramona*, a year before her death. L.J.

Her Works include *Mercy Philbrick's Choice* and *Hetty's Strange History*.

JACKSON, "STONEWALL," THOMAS JONATHAN (1824-1863), was a Confederate general. He has often been called the best officer who fought under Robert E. Lee in the War between the States. Jackson led his brigade in the first Battle of Bull Run at Manassas. His men faced what seemed to be overwhelming forces of men and ammunition. But Jackson and his men stood their ground firmly. "There stands Jackson like a stone wall," General Barnard E. Bee called out. The name fitted Jackson's character so well that he was always known as "Stonewall" Jackson after that. His brigade was called "Stonewall's Brigade."



Chi. Hist. Soc.

"Stonewall" Jackson, one of the greatest generals in the Confederate Army

Jackson distinguished himself by swift marches and hard fighting. His soldiers liked him and trusted his ability. After Jackson died, General Lee could not find a man who could fill his place adequately.

Early Career. Jackson was born at Clarksburg, Va. (now West Virginia), and was left an orphan at an early age. As a boy, he received only the little education that was offered in a country school at that time. When he was eighteen years old, he was admitted to the United States Military Academy at West Point.

Jackson was graduated in 1846 and soon joined the army that was fighting in Mexico. He proved his bravery at the battles of Vera Cruz, Contreras, and Chapultepec, and was promoted to the rank of major in less than a year.

From 1851 until the beginning of the War between the States, Jackson was a professor in the Virginia Military Institute at Lexington, Va. He was not considered a very interesting teacher, but he was thought to have a good influence on his students. He was very religious, and his Christian faith influenced his whole life. He prayed before and after every battle, and urged his men also to pray.

In the Southern Army. Jackson took up the cause of the Confederacy, although he would have been glad to see the Union preserved. He was promoted to the rank of major general after the Battle of Bull Run. During the spring and early summer of 1862, he won lasting fame in the Shenandoah Valley. There were several Union generals fighting against him there, but Jackson defeated them in battle and kept them from trapping him. He drove back forces at Cross Keys and Port Republic. Then he moved to join Lee who was facing General George McClellan at Richmond.

Jackson took part in the fighting known as the Seven Days' Battles which ended when McClellan's forces withdrew to the James River. He was also sent against General Nathaniel Pope in northern Virginia. Jackson held out against severe attacks of the Federal Army in the second Battle of Bull Run. Then Lee arrived and the Confederate forces won a great victory. "Stonewall" commanded the left part of Lee's army at Antietam (Sharpsburg) and the right at Fredericksburg in December, 1862.

Culver

General "Stonewall" Jackson Leading a Prayer in His Confederate Camp during the War between the States

Tragic Death. In 1863 he made a brilliant march around General Joseph Hooker's forces at Chancellorsville and drove the Federal Army back in disorder. But when he went ahead of his line of battle at twilight to do some scouting he was accidentally shot by one of his own men. He died a week later. The Confederate Army won the battle in which Jackson fell, but his death more than offset the victory over the Union forces. General Lee declared that he had lost his right arm when Jackson died. Jackson was buried at Lexington, Va. H.J.E.

See also WAR BETWEEN THE STATES.

JACKSON HOLE. See NATIONAL MONUMENT.

JACKSONIAN DEMOCRACY. See JACKSON, ANDREW (introduction; Administration as President).

JACKSONVILLE, Fla. (population 204,517). This beautiful semitropical city is the industrial capital and largest city of Florida. Jacksonville lies on both banks of the St. Johns River, about twenty miles west of the Atlantic Ocean and about forty miles northwest of St. Augustine, Fla. See FLORIDA (inset on colored map).

Jacksonville is one of the large industrial cities of the southeast. It has about 500 factories. They produce large amounts of lumber, naval stores, pulp and paper, roasted coffee, cigars, fertilizers, chemical products, and canned goods. Other products of the city include steel and stone, automobiles, shipbuilding, and petroleum.

Five railroad trunk lines enter Jacksonville. The city has a 32-foot channel to the ocean at low tide, and is a busy shipping center. It also has three airports.

The Spanish built Fort Nicolaus on the site of Jacksonville in 1740. The fort was burned by warring Indians in 1812. The town of Jacksonville was laid out in 1822 on King's Road, which runs between Georgia and Florida. It was named in honor of Andrew Jackson, the first military governor of the Florida territory. In 1832 Jacksonville was incorporated as a city. A fire destroyed the city's business section in 1901. The city was quickly rebuilt, and the population doubled between 1900 and 1910. Jacksonville is the county seat of Duval County. The city has built a thirty-six-mile boulevard along its beaches. There are more than 200 beautiful parks in the city. Jacksonville has a combined commission and mayor-council form of government. See COMMISSION FORM OF GOVERNMENT; MAYOR.

A United States Naval Air Station, located about ten miles south of the city, was commissioned in 1940. During World War II the station covered more than 3,000 acres and was staffed by about 12,000 men. K.T.A.

JACKSONVILLE, Ill. (population 20,387). This city has more colleges and state institutions for its size than any other city of Illinois. It is the home of Illinois College, MacMurray College, the Illinois School for the Deaf, the Illinois School for the Blind, and the Jacksonville State Hospital for mental cases. Jacksonville is the county seat of Morgan County. The city lies in the rich corn-growing region of west-central Illinois, and is an important trading center. P.M.A.

JACKSTONES. See JACKS AND JACKSTONES.

JACOB, *JA kub*, was the real ancestor of the Hebrew nation, according to the Bible. He was the twin brother of Esau, whose birthright, that is his rights as eldest son, he bought for a mess of pottage. When his father Isaac was old and nearly blind, Jacob dressed like his brother and so won the blessing which gave him the birthright. Esau was very angry when he discovered the trick. He threatened to kill Jacob, so Jacob departed for Haran, pretending he wanted to seek a wife. He stayed there for twenty years.

Jacob married Leah and Rachel. They were the daughters of his Uncle Laban, for whom he worked. Then he started back to Canaan. On the way he was terrified at news that Esau was coming with four hundred men to meet him. But instead of taking revenge Esau showed great brotherly feeling. Jacob settled near Shechem on his return to Palestine, near the center of the land. But the writer of the Bible story soon shifts his interest to Jacob's sons, especially to Joseph. There is little further information about Jacob. As an old man he was saddened when his favorite son Joseph was sold by his brothers into bondage. Later Jacob joined Joseph in Egypt. It was there that Jacob's life ended.

The name Jacob is known in sources other than the Bible, as early as the 1600's B.C. W.A.I.

See also ESAU; ISAAC; JOSEPH; RACHEL.

JACOBIN, *JACK oh bin*. The most famous political society in France during the French Revolution was known as the Jacobin Club. The society got its name from the fact that it met in a hall which had belonged to the Convent of St. James in Paris. After the royal court and the National Assembly were removed to Paris, the Jacobins rapidly grew in power and importance. They finally became the ruling power of the Revolution. The Jacobins dominated the Commune of Paris, which organized the mob demonstrations against the king. Their most influential member, Robespierre, practically ruled France during the Reign of Terror. The downfall of Robespierre in 1794 broke the power of the Jacobins. The club was closed in 1799.

The name *Jacobin* is still applied in France to a person who upholds radical measures in legislation. J.S.S.

See also DANTON, GEORGES JACQUES; FRENCH REVOLUTION; GIRONDIST; ROBESPIERRE, MAXIMILIEN MARIE ISIDORE DE; SIEYÈS, EMANUEL JOSEPH.

JACOBS, HELEN HULL (1908-). See TENNIS (American Tennis Champions).

JACOBS, JOSEPH (1854-1916), was an Australian historian, an authority on anthropology and folklore, and a popular collector and writer of fairy tales. He was born in Sydney, Australia, and was graduated from Saint John's College, Cambridge, England. Later he studied Jewish literature and philosophy in Berlin. In 1900, Jacobs moved to New York City, where he became professor of English literature at the Jewish Theological Seminary of America. From 1906 until his death he was editor of the magazine *American Hebrew*. G.S.B.

His Works include *The Jews of Angevin England; History of the Jews in Spain; Studies in Biblical Archaeology; Earliest English Version of the Fables of Bidpai;* and collections of English, Irish, and Indian fairy tales. He also edited *The Fables of Aesop* and *The Thousand and One Nights; or, Arabian Nights' Entertainments*.

JACQUARD, *ja KAHRD*, is the name of an elaborate woven design found in table damask, bedspreads, and brocades. The weave gets its name from the Jacquard loom, on which flower designs or even pictures of men and women can be woven. The name Jacquard is also used for a type of knitting which requires a machine somewhat like the Jacquard loom to make changes in color and design. See also JACQUARD, JOSEPH MARIE. G.G.DE.

JACQUARD, *zhah KAHR*, **JOSEPH MARIE** (1752-1834), was the inventor of the Jacquard loom, which greatly simplified weaving. This loom could make intricate patterns as easily as the older looms made plain woven cloth.

Jacquard was born in Lyons, France. His loom was exhibited in 1801 at the Industrial Exhibition in Paris, and won a bronze medal. Jacquard's loom was a step forward in the production of cloth, but it was also a danger to his life. Thousands of silk workers were thrown out of work by his machine, and on one occasion he was seized by an angry mob and barely escaped being killed.

Instead of remaining in the hands of individual silk manufacturers for patent-protected private exploitation, the loom was made public property in 1806, through its purchase by the French Government. This hastened the lowering of silk prices which, in turn, greatly increased the market for silk, and so more quickly provided for re-employment of workers in the silk industry. E.Y.

See also JACQUARD.

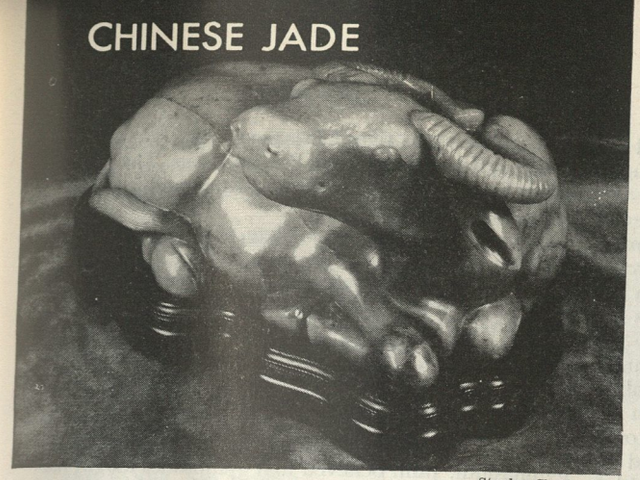
JACQUE, *zhahk*, **CHARLES ÉMILE** (1813-1894), was a French painter who won the nickname, "Raphael of the Pigpen," for his lifelike farmyard scenes. He studied engraving and etching in Paris and England, but finally settled at Barbizon to paint animals. Jacque belonged to the group of painters of rural life then popular in Europe. He excelled in the painting of farm animals. His "Coming Storm" shows sheep crowding together for protection against the weather, and was one of the most popular paintings of its time. Jacque's "Sheepfold" and "Landscape with Sheep" are hung in the Metropolitan Museum in New York City. M.C.C.

JACQUELINE, *JAK weh lin*, **OF BAVARIA** (1400-1436), was Countess of Holland and heir of William VI of Bavaria. After a long struggle, Philip the Good of Burgundy finally forced her to give up her claims to her Bavarian possessions.

JACQUERIE, *ZHAK REE*, was a revolt of French peasants which took place in 1358, during the period of the Hundred Years' War. The peasants rebelled against the rule of the nobles. The word *Jacquerie* comes from *Jacques Bonhomme* (Jack Goodfellow), which was a scornful name French noblemen gave to French peasants.

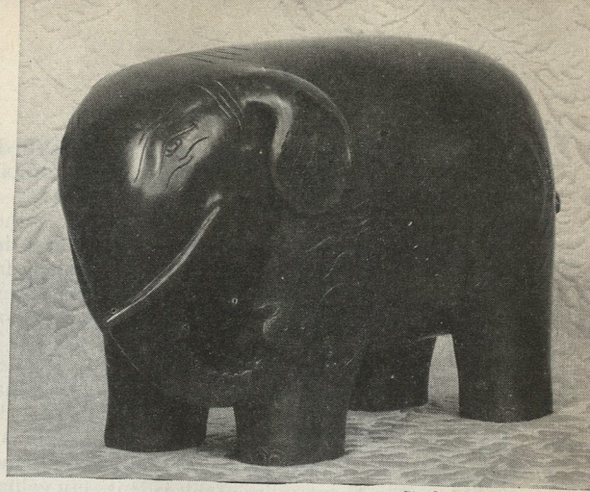
JADE. This hard, tough, and highly-colored stone is widely used for fine carvings and jewelry. During the days of ancient Chinese civilization, it took the place of gold and other precious stones. The Chinese carved it into jewelry, and also buried it with their dead. Many beautiful jade carvings, dating from 1400 B.C., have been dug from the ruins of An-Yang, the capital of the first Chinese dynasty. Through the years, the Chinese developed new sources of the mineral and improved their carving technique. Jade carving reached its height during the Ming Period (1368-1644). The jade carvings of this period are treasured by collectors throughout the world.

CHINESE JADE



Stanley Charles Nott

A Kneeling Buffalo of about 100 B.C. once adorned an altar dedicated to earth in lower Szechwan, China.



Stanley Charles Nott

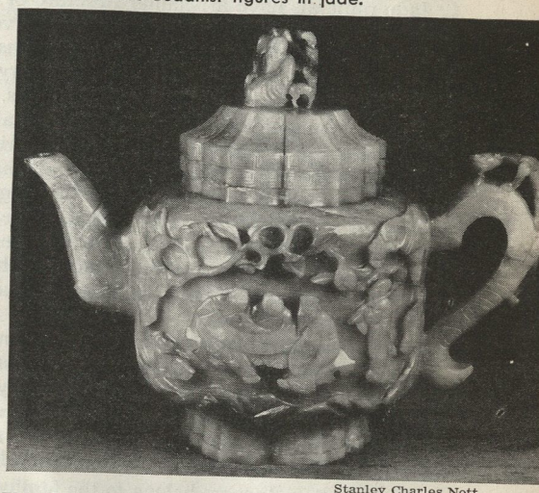
The Famous Buddhist Elephant of about A.D. 100 is one of the earliest Chinese Buddhist figures in jade.

Chicago Nat. Hist. Mus.

This Blue Jade Censer from China was used to burn sweet-smelling incense.

Chicago Nat. Hist. Mus.

A Chinese Lady carved in white jade

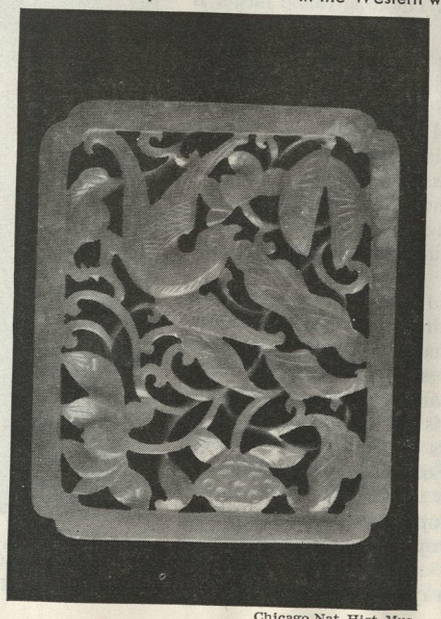


Stanley Charles Nott

This Chinese Teapot is one of the oldest jade teapots in the Western world.

Art Institute of Chicago

Jade Bowl and Cover by a Chinese artist of the 18th century



Chicago Nat. Hist. Mus.

Beautifully Carved Jade Plaque, worn as an ornament in China

Stanley Charles Nott

Green Altar Screen of the Shun-Chih jade period (about A.D. 1650)

Two minerals, jadeite and nephrite, are classified as jade. Their chief colors are white and green, although many other colors are found.

Nephrite, the chief source of jade, was the mineral which the early Chinese used for carving. At that time, it came from Turkestan. Today, it comes chiefly from New Zealand and Wyoming. After it is taken from its source, nephrite is shipped to jade-cutting centers at Peiping, Shanghai, and Canton.

Jadeite is a rare jade mineral, found only in Burma, and in carved objects in Mexico. It is more valuable than nephrite because of its beautiful colors, such as light green or lilac. Once in a while, small amounts of a transparent emerald-green colored jadeite are found in boulders. The best quality of this jade is very valuable. It is superior to some really old Chinese pieces.

Jade minerals have a peculiar structure of interlocking meshes of fine needles which make them very strong and suitable for carving into delicate patterns and thin implements. This quality made jade very popular among the primitive peoples of many lands. Nephrite tools were found in the Lake Dweller remains of the New Stone Age in Europe and Central America. F.H.P.

JAEGER, *YAY ger*. The jaeger is a gull that lives in northern regions. It is also called the hunting gull, and is a small relative of the skua. Jaegers have brown or blackish feathers, and hooked beaks. There are three kinds that make their summer homes in the tundras bordering the Arctic seas. In winter they travel south, mainly over the oceans.

On the tundras, jaegers build their nests on grassy or mossy hillocks. They are enemies of other northern birds, for they eat eggs and young birds. They may even seize small adult birds. Away from the tundras, their chief food is fish. They capture the fish themselves, or take them away from terns and smaller gulls. A.W.

Classification. Jaegers belong to the family *Stercorariidae*. The pomarine jaeger is *Stercorarius pomarinus*. The parasitic jaeger is *S. parasiticus*. The long-tailed jaeger is *S. longicaudus*.

JAEL, *JA el*, or **JAHEL.** See DEBORAH.

JAFFA. See PALESTINE (Cities).

JAGELLON. See POLAND (Government and History).

JAGGERY, *JAG ur ih*. See PALM.

JAGUAR, *JAG wahr*, is the largest and handsomest of the great cats in the Americas.

Most jaguars are now found from Central America south to Argentina, in South America. There are still some of them in Mexico. In pioneer days they ranged as far north as Arkansas.

This fierce cat is from six to seven feet long from the end of its nose to the tip of its tail. Its coat is usually deep yellow, marked with many black spots. Some of the spots look like broken rings. In the South American forests there are jaguars that are almost coal black. The jaguar may live in the woods or on the treeless plain.

The jaguar kills and eats game birds, deer, pigs, tapirs and smaller animals. Sometimes it attacks horses and cattle on ranches. It is usually afraid of human beings, but may attack an unprotected man. It seldom strikes in the open, but jumps upon its prey from a hiding place.

Many people who live in countries where there are jaguars call it "the tiger." It is next to the lion and tiger in strength and size among the great cats. The jaguar's roar is loud and deep, and is one of the most frightening things about the animal. H.E.A.

See also ANIMAL (color plate, Central and South America); CAT.

Classification. The jaguar is a member of the family *Felidae*. Its scientific name is *Felis onca*.

JAHAN SHAH. See SHAH JAHAN.

JAHN, *yahn*, **FRIEDRICH LUDWIG** (1778-1852), was a German teacher of gymnastics. He was the father of the *Turnverein*, or gymnastic club. These grew up in Germany and the rest of Central Europe. He began teaching gymnastics in Berlin in 1809, and soon built a gymnasium. Jahn believed that gymnastics taught harmony, rhythm, and co-operation. He was arrested in 1819 for his political activities in favor of German independence, and sent to prison for several years. But when Frederick William IV became king of Prussia in 1840, he decorated Jahn with the Iron Cross.

A *Turnhalle*, or school of gymnastics, is built over Jahn's grave in Freiburg. E.W.KN.

See also TURNVEREIN.

JAI ALAI, *hi ah LI*, is a game played with a hard ball about the size of a baseball and a basketlike container called a *cesta*. The upper part of the cesta is strapped to the player's arm. On the other end of the cesta is the curved container for catching the ball and throwing it forward again. The game is played in a court with high walls on three sides. The spectators sit behind a protecting screen on the fourth side.

The game may be played singles, doubles (two to a team), or triples (three to a team). The server hits the ball against the wall, and his opponent must catch it either before it hits the ground or on the first bounce. The opponent then also hurls the ball against the wall, and the server must hit it back. If the opponent misses

Victor De Palma, Black Star

A Jai Alai Player Jumps against a Wall of the Court to catch the ball in his basketlike cesta. The old Spanish game is very fast, and injuries to players are frequent.

his catch, the server gets a point. If the server misses, the serve goes to the opponent. Six points is usually a singles game. In doubles and triples the game point may be thirty.

Jai alai is very similar to handball, except for the cesta. The game is fast and dangerous. The words *jai alai* are from the Spanish, meaning *merry festival*. A similar game in the Basque provinces of Spain is called *pelota*. The game is not much played in the United States except in Florida, but is a favorite in Cuba. The Mexicans played it many generations ago, and the Cubans learned about it from them. As in horse racing, betting is an important part of this sport. E.D.M.

JAIL. See PRISON.

JAIL FEVER. See TYPHUS.

JAIN. See GANDHI, MOHANDAS KARAMCHAND.

JAIPUR. See INDIA (Cities).

JAKARTA. See BATAVIA; INDONESIA (inset on colored map).

JALAP, *JAL ap*, is a twining vine which belongs to the morning-glory family. It gets its name because it grows chiefly in the area of the Mexican town, Jalapa,

Flowers, Foliage, and Roots of Jalap. This is a medicinal vine which was originally found in Jalapa, Mexico.

which is about 4,800 feet above sea level. The root of the jalap produces a laxative drug. It is shaped like a turnip and grows from one to four inches long. It is cultivated commercially in India and Jamaica. The drug is usually combined with calomel or potassium bitartrate. It should never be taken except under a doctor's direction. See also CONVOLVULUS. H.N.M.

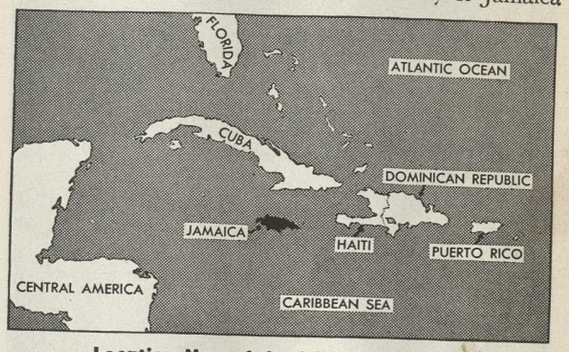
Classification. Jalap, *Exogonium purga*, belongs to the family *Convolvulaceae*.

JAM. See JELLY AND JAM MAKING.

JAMAICA is the largest island in the British West Indies. It is a tropical paradise of high mountains, soft breezes, and colorful plants and flowers. Jamaica lies in the Caribbean Sea, ninety miles south of Cuba. It is Great Britain's chief naval base in the West Indies.

Jamaica has many waterfalls, streams, and springs. The name *Jamaica* comes from an Indian word, *Jamayca*, which means *island of springs*.

Size and Surface Features. The colony of Jamaica



Location Map of the Island of Jamaica

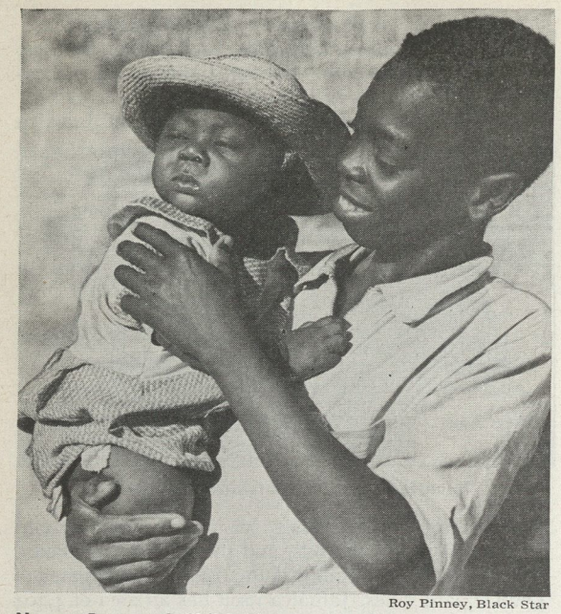
includes not only Jamaica island but the Cayman, Turks, and Caicos islands, and the Morant and Pedro cays. Together the islands of the colony have an area of 4,628 square miles. Jamaica itself has an area of 4,404 square miles and is a little smaller than the state of Connecticut. See CUBA (colored map).

The island is about 144 miles long, and 50 miles wide at its widest point. It is shaped like a turtle, with east-west mountain ridges forming the turtle's back. These mountains rise in the east to the purple, cloud-capped peaks of the Blue Mountains. The highest point is Blue Mountain, which stands 7,388 feet above the sea. There are lowlands in the western end and a narrow strip of flat land along the southern coast. The coast has many good bays. The chief port is Kingston. Short rivers flow north and south from the central mountain ridge.

Climate and Resources. Jamaica is cooled by ocean breezes and the trade winds. In the mountains the climate is delightful both in winter and in summer. At Kingston the temperature rises to 85° F. in the summer. Rain falls the year round, but May and October are the wettest months. The chief resource of the island is its fertile soil. All types of tropical crops grow well in various parts of the island. The mountain slopes are covered thickly with flowers and trees. Mosses, vines, and orchids hang on the branches. Jamaica has some minerals, including iron, lead, cobalt, marble, porphyrites, and granite. But these deposits are little used.

The People. Jamaica has a population of 1,417,000. Nearly 95 per cent of the Jamaicans are either of Negro or mixed Negro and white descent. There are about 15,000 whites, 22,000 East Indians, and 7,000 Chinese. Most of the Negroes are farm laborers. The business and professional classes are made up chiefly of mulattoes.

The first Negroes were brought in as slaves by the Spanish and English settlers. The East Indians were brought to work on the plantations after the slaves were freed. The Chinese people usually keep shops or conduct businesses. Most of the people live in rural areas. The chief cities are Kingston, the capital, and Spanish Town (population 14,000). Spanish Town lies on the southern coast eleven miles west of Kingston. It was the



Roy Pinney, Black Star

Negro Boy and Child of Jamaica. When the Spaniards first settled in Jamaica, the island was inhabited by peaceful tribes of Arawak Indians. They were enslaved, and treated so cruelly that many died. Most of the present population are descended from Negro slaves brought by early settlers.

capital of the island of Jamaica until 1872.

Their Work. Most of the people earn their living by farm labor. The chief products are sugar cane, coffee, bananas, cacao, coconuts, citrus fruits, tobacco, and tropical fruits. Allspice, ginger, and arrowroot are other important products. The forests yield valuable hardwoods such as logwood, rosewood, and mahogany. The catching of turtles is important along the coast.

The British Government is spending a great deal of money to improve agricultural conditions in Jamaica. Improvement can be made by better farming methods and raising crops for use by the people instead of for export. The island is far too dependent on such plantation crops as sugar, which bring in too little money to pay the people a decent wage. Work on plantation crops is seasonal, and there is not enough of it to go around. Living standards are low in Jamaica. Few people actually starve, because tropical fruits like the mango grow abundantly and provide a large part of the food supply. But health and other living conditions are bad.

Most of the island's trade is carried on with Great Britain, Canada, and the United States. The principal exports are sugar, rum, tropical and citrus fruits, pimento, allspice, coffee, ginger, cocoa, and coconuts. Jamaica imports flour, cotton goods, clothing, fish, paper, machinery, drugs, glassware, gasoline, and hardware.

Education and Religion. Jamaica has about 670 public elementary schools. There also are several industrial schools, vocational schools, and training colleges. The University College of the West Indies, an affiliate of London University, was chartered in 1949. Many of the people cannot read or write. Most of the Jamaicans are Christians. They belong to the Church of England and the Presbyterian, Roman Catholic, Methodist, Baptist, Seventh Day Adventist, and other churches.

Government. Great Britain gave the colony a new constitution in 1944. The chief executive is still the governor, appointed by the British king. All citizens may vote after they are 21 years old.

The House of Representatives has 32 elected members and the upper house, the Legislative Council, has 15 appointed members. There is also an Executive Council of 10 members, 5 named by the governor and 5 by the House of Representatives. The governor has the power to veto laws. The smaller islands which form part of the colony of Jamaica are ruled as dependencies.

History. Columbus discovered the island of Jamaica in 1494. At this time it was inhabited by Arawak Indians, who were treated so cruelly that they died out soon after the Spanish came. English forces captured the island in 1655. The Treaty of Madrid gave England legal possession in 1670. At that time Jamaica was a refuge for the pirates and buccaneers who attacked shipping in the Spanish Main. Their favorite haunt was the city of Port Royal, near Kingston harbor. Port Royal was afterward destroyed by an earthquake. One of these buccaneers was Henry Morgan, who served the governor of Jamaica and later became governor himself. See MORGAN, HENRY, SIR.

After the Royal African Company was formed in 1672, Jamaica became the greatest slave market in the world. The slaves were freed in 1833, and business conditions suffered because the industries of the island depended on slave labor. An earthquake struck the island in 1907. It destroyed most of the city of Kingston. Before World War II, the Jamaicans began to demand better living conditions and a voice in their own government. Conditions grew worse during the war, for Jamaica could no longer export crops or import supplies. Jamaican workers were sent to the United States to work temporarily on American farms. In 1940 Great Britain leased a site on Portland Bight to the United States for use as a naval and air base. R.PEA.

See also CUBA (colored map); BRITISH WEST INDIES; KINGSTON.

JAMAICA BAY. See NEW YORK CITY (Other Interesting Places to Visit).

JAMAICA PEPPER. See ALLSPICE.

JAMBOREE. See BOY SCOUTS OF AMERICA (Jamboree).

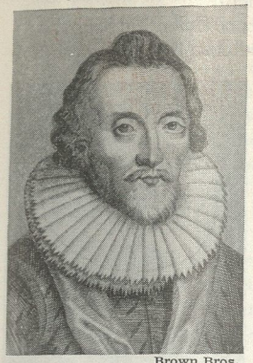
JAMES was the name of two kings of England. The first James began the rule of the House of Stuart.

James I (1566-1625) was the son of Mary Queen of Scots and Lord Darnley. He became James VI of Scotland in 1567. In 1603, he was crowned king of England. Scotland and England were thus united under one ruler, but they did not unite politically until Queen Anne became ruler.

James was a firm believer in the "divine right of kings." He quarreled bitterly with Parliament, which fought many of his arbitrary acts. He tried to make all Englishmen belong to the Church of England, and he persecuted both the Roman Catholics and the Protestant groups. A number of Catholics plotted to blow up the Parliament House on its opening day in 1605. The plot was discovered, and the leaders were executed.

James' religious intolerance led many Englishmen to seek freedom in America. The first English colony in

America was established in 1607. It was named Jamestown in honor of the king. In 1620 a group of Pilgrims settled in Massachusetts. They had left England because of religious grievances. Protestants from England and Scotland also settled in the Irish province of Ulster.



Brown Bros.

James I, the first king of England and Scotland

The authorized English translation of the Bible was published in 1611. It is known as the *King James Version,* and it is still standard today. Other important events during King James' reign were the execution of Sir Walter Raleigh, and Parliament's impeachment of the king's great chancellor, Sir Francis Bacon.

James married Princess Anne of Denmark in 1589. Their daughter Elizabeth married the German elector of the Palatinate. This marriage resulted later in the founding of the English House of Hanover. See also GEORGE (I, England).

James II (1633-1701) was a younger son of Charles I and Henrietta Maria of France. He became king in 1685 after the death of his brother, Charles II. He tried immediately to carry out two of his main desires—to rule independently of Parliament, and to restore the Roman Catholic religion in England. His efforts aroused great opposition. James put down the rebellion led by the Duke of Monmouth. But James's continued attempts to restore Catholicism aroused the anger of the entire nation. The "Glorious Revolution" of 1688 forced James to give up the throne, and he fled the country. William of Orange and his wife, Mary, a daughter of James II, were proclaimed joint rulers. James was cordially welcomed by King Louis XIV of France who furnished him with troops, and in 1689 James tried to win back his throne by invading Ireland. He was thoroughly defeated at the Battle of the Boyne, and spent the rest of his life in retirement in France. P.KN.

Brown Bros.

James II lost the throne of England in the "Glorious Revolution" in 1688.

Related Subjects. The reader is also referred to:

Bible (The Accepted Protestant Versions in English)
Boyne, Battle of the
Divine Right of Kings
Gunpowder Plot
Mary (II, England)
Mary (Queen of Scots)
Monmouth, James Scott, Duke of
Stuart, House of

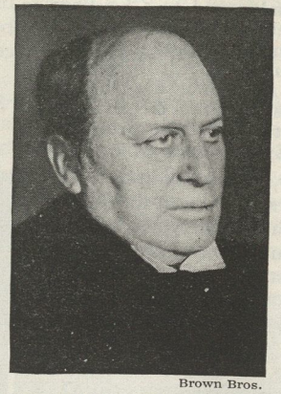
JAMES is the name of two, and possibly three, persons in the New Testament. They include:

(1) **James,** the brother of John and son of Zebedee. He was one of the twelve Apostles, and is known as James the Greater to distinguish him from

(2) **James the Less,** son of Mary who was the wife of Cleophas. Some make of this James a different person from James, the son of Alphaeus (Matt. 10:3), who is named in the lists of the twelve Apostles. The Eastern Orthodox Church gives them separate feast days, but Roman Catholic tradition sees the same person in both. James, "the brother of the Lord," is supposed by some to be James the Less, whether or not the identification of Cleophas and Alphaeus is accepted. F.C.G. and F.J.S.

See also APOSTLE; JAMES, SAINT.

JAMES, HENRY (1843-1916), was a distinguished American novelist. He was noted for his skillful handling of the "international novel," which portrayed typical American characters in English settings, and showed the differences between the manners, ideas, customs, and points of view of Americans and Englishmen.



Brown Bros.

Henry James, American author, who won fame as pioneer of the "international novel"

The style of James' early novels was simple, and his sentences were less complicated than in many of his later novels. In his later years he developed an intricate style. The reader often got lost in the long, involved sentences. His novels have been described as "marvels of cleverness but splendidly unreadable."

Henry James was born in New York City and educated there and abroad. William James, the psychologist and philosopher, was his brother. James gave up the study of law for a literary career, which he developed mostly in England. In 1915 he became a subject of Great Britain, and lived there until his death. L.J.

His Works include *Roderick Hudson; Daisy Miller; An International Episode; The Bostonians; The Tragic Muse; What Maisie Knew;* and *The Awkward Age.*

JAMES, HENRY (1879-1947), won the 1931 Pulitzer prize for biography with his book, *Charles W. Eliot.*

James was born in Boston, the son of William James, the philosopher, and nephew of Henry James, the novelist. He was educated at Harvard University and practiced law eight years in Boston. In 1912 he became manager, and later a trustee, of the Rockefeller Institute for Medical Research. G.S.B.

See also PULITZER PRIZES.

His Works include *Richard Olney* and *The Letters of William James,* which he edited.

JAMES, JESSE WOODSON (1847-1882), was a bandit who terrorized Missouri for twenty years. He was born at Centerville (now Kearney), Mo., and near the end of the War between the States joined the Confederate guerrilla force of William Quantrill. Quantrill was killed in 1865. Jesse James was severely wounded but recovered. In 1866 he and his brother Frank formed a band of outlaws.

They began a long series of train and bank robberies. The state of Missouri finally offered a reward of $10,000 for James' capture, dead or alive. He was treacherously killed in his home by two members of his band. Stories about him became a part of American folklore. T.R.H.

JAMES, MARQUIS (1891-). See OKLAHOMA (Arts).

JAMES, SAINT, was head of the Christian Church in Jerusalem during the first years after it was founded. He is regarded by many as "the Lord's brother," (Gal. 1:19), but others believe that he was a cousin of Jesus. The Jews called him "the Just," probably because of

his strict observance of the law. The New Testament seldom speaks of him by name. But his life can be traced through the story of his church. History tells us that he died a martyr, killed by a mob in Jerusalem in A.D. 62.

Epistle of James is one of seven letters called "General Epistles" because they are addressed to Christians in general. It forms the twentieth book of the New Testament. The writer used the name of James, but not all scholars are satisfied that James wrote it. Some believe the author may have lived in Antioch because the Epistle is written in Greek and seems to contain Greek ideas. Its purpose was to warn Christians that the profession of faith can not take the place of good deeds. F.C.G. and F.J.S.

JAMES, WILL (1892-1942), was a well-known American writer and illustrator of stories about the West. His popular book, *Smoky*, won the Newbery Medal in 1927. James wrote his books from his own experiences as a cowboy, and drew the illustrations for his books from

Charles Scribner's Sons

"Smoky," Written and Illustrated by Will James, is a story about a marvelous mouse-colored pony. In breezy Western slang, James tells of life on the ranch, range, and desert.

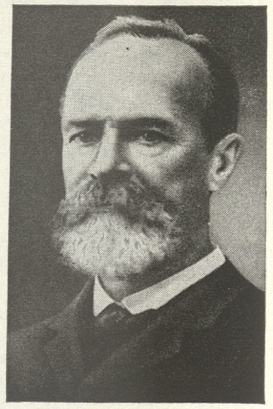
life. He was born near Great Falls, Mont. His parents died when he was a small boy, and he was adopted by a French-Canadian trapper. Later he worked on ranches in all parts of the West from Texas to Canada. A riding accident forced him to quit ranch work, and he took up drawing. He published his first book in 1924. F.C.

See also NEWBERY MEDAL.

His Works include *The Drifting Cowboy; In the Saddle with Uncle Bill; Home Ranch; Horses I've Known;* and *The American Cowboy.*

JAMES, WILLIAM (1842-1910), was a distinguished American psychologist and philosopher. His early work did much to raise psychology to the rank of a full-fledged science. His later work as one of the originators of the philosophy called *pragmatism*, along with that of C. S. Peirce and John Dewey, became one of the principal interpretations of the modern world of science, education, and technical development.

James studied at the Lawrence Scientific School, and later received a degree in medicine from Harvard University. He taught at Harvard from 1872 to 1907. He first taught anatomy, and then switched in turn to physiology, psychology, and finally to philosophy. From 1899 to 1901 he lectured on natural religion at the University of Edinburgh, and in 1908 he lectured on philosophy at Oxford.



William James, American psychologist, was a leader in studies of the human mind.

The change in the subjects which James taught reflected the growth of his ideas. In 1890 he published his theories in the *Principles of Psychology*. The book immediately won him international attention. Such of of his theories as that of the "fringe of consciousness" attracted wide interest. In later books he wove some of his psychological ideas into his philosophy and religion. His philosophy of *pragmatism* accepts only that which can be proved in action or practical effect. He favored this practical philosophy as against the "idealism" of the German philosophers. This philosophy, which is sometimes called "operationalism" by scientists, has become dominant in the field of science. See PRAGMATIST.

James was born in New York City. He was the brother of Henry James, the novelist. The freshness and charm of his writing style has led some people to say that he should have been the novelist, while his brother should have applied his involved studies of mental processes to psychology. B.B.

His Works. *Principles of Psychology* was the outstanding work in its field. James's other works include *Pragmatism—a New Name for Some Old Ways of Thinking; Varieties of Religious Experience; The Will to Believe; A Briefer Course in Psychology; Human Immortality; The Meaning of Truth;* and *Talks on Psychology and Life's Ideals.*

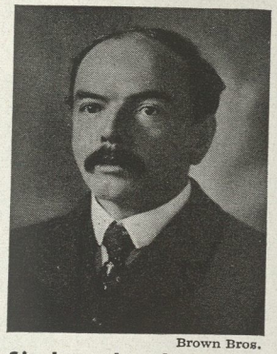
JAMES BAY is the southern arm of Hudson Bay in northeast Canada. The bay was named for the English explorer, Thomas James. He explored the bay in 1631 and again in 1633 while trying to discover the Northwest Passage. James Bay lies between Ontario and Quebec. It is about 300 miles long and 160 miles wide.

Many islands lie in the bay. Akimiski, the largest island, is about seventy miles long. Several large rivers flow into the bay. Among them are the Moose, Nottaway, Albany, and Missinaibi.

Several railroads carry cattle and grain from western Canada to the shores of James Bay for shipment across the Atlantic during the summer. In winter the bay is frozen over and closed to shipping. The Canadian Government has made plans to develop the James Bay area as a farming and trading center. H.U.S.

JAMES MILLIKIN UNIVERSITY is a coeducational liberal arts school with vocational training at Decatur, Ill. It is controlled by the Presbyterian Church. Courses are offered in business administration, secretarial science, industry, home economics, engineering, and engineering administration. The university also has a noted school of music. Graduate work is offered in music and education. The university was founded in 1903 and has an average enrollment of about 850.

JAMESON, *JAYM sun,* **LEANDER STARR, SIR** (1853-1917), was an Englishman who became famous as a South African leader. He was born in Edinburgh and studied medicine there. He went to South Africa in 1878, and practiced medicine at Kimberley. He later entered politics and became premier of Cape of Good Hope province.



Brown Bros.

Sir Leander Jameson, South African statesman and soldier of the Boer War

Jameson supported the foreigners in the growing troubles between the Boer settlers of South Africa and the *Uitlanders*, or foreigners. Late in 1895, inspired by Cecil Rhodes, he led 500 troops from Bechuanaland in a raid into the Boers' Transvaal stronghold. This raid became known as "Jameson's raid." The small army was defeated, January 1, 1896. Jameson was turned over to the British Government, and was sentenced to fifteen months in prison for leading a rebellion. But he became ill and was released.

In 1900 he was elected to the Cape Colony legislative assembly. He was premier of Cape Colony from 1904 to 1908. E.McI.

See also BOER WAR; FILIBUSTER.

JAMES RIVER. Jamestown, the first permanent English colony in America, was settled on the banks of this stream in 1607. The James River is the largest waterway lying wholly within the state of Virginia. The river rises in the Allegheny Mountains at the meeting point of the Jackson and Cowpasture rivers. From here the James flows southeastward for about 450 miles. It empties into Chesapeake Bay through the Hampton Roads channel. The Appomattox, one of the chief branches of the James, enters the river sixty-six miles from the sea. From this point the James is a tidal stream and can accommodate large ocean steamers. Smaller ships can sail about forty miles farther up the river to Richmond, the capital of Virginia. L.D.,JR.

JAMESTOWN (population about 1,500) is the capital of Saint Helena, a British island in the South Atlantic Ocean. It lies at the mouth of a small mountain stream which flows into a natural harbor created by Saint James' Bay. Jamestown is the only city and port on the island. It is a center of trade and a shipping point for potatoes, which are the chief product of the island. R.PEA.

JAMESTOWN was the first permanent English settlement in America. The first settlers landed on May 14, 1607. Three shiploads of them, 105 men, had been sent from England by the London Company. The enterprise was started for trade and settlement and to establish bases for explorations to find gold and silver.

After five months at sea, they sighted the broad waters of Chesapeake Bay on April 26, 1607. They sailed up the James River for seventeen days, and then chose a small peninsula fifty miles from its mouth as the site of their colony. Both the river and the settlement were named after King James I of England.

It soon became clear that they had chosen their site badly. The ground was low and swampy. The food supply was limited and the drinking water was bad. The settlers fell ill of malaria. Hostile Indians raided the colony. These Indians were organized into forty tribes. Altogether there were probably about twenty thousand Indians. Thirty of the tribes formed a confederation led by the able chief Powhatan. Powhatan was the father of Pocahontas, the famous Indian princess who saved the life of Captain John Smith, according to Smith's own story. Pocahontas married John Rolfe, one of the colonists, in 1614. After that the Indian attacks died down for a time.

In 1622 a tribe of Pamunkey Indians attacked Jamestown and killed three hundred and fifty men, women, and children. The colonists struck back with such terrible vengeance that the Indians let them alone for more than twenty years. But in 1644 the Pamunkey Indians attacked the village again.

The Jamestown settlement went through one dreadful experience after another. The first settlers could hardly have survived had it not been for the experience, good sense, and firm control of Captain John Smith. In 1676 the town was burned to the ground during Bacon's Rebellion. Twenty-two years later another fire destroyed the village. The remaining settlers left the ruins of their

Brown Bros.

Wives of the Jamestown Settlers Came from England to the new land after homes had been built and farms started.

homes and moved to the so-called Middle Plantation. In 1699 this settlement took the name of Williamsburg and became the capital of the colony.

Jamestown was the scene of many important events of America's early colonial history. The House of Burgesses met there in 1619. The first brick house ever built in North America was built in Jamestown about the year 1640. Today the site of Jamestown has been cut off by water from the mainland. It is now an island. Only a few foundation stones and the ruined tower of a brick church, built between 1676 and 1684, still stand as re-

The Ruins of the Old Church Tower at Jamestown, Va., mark the site of the first permanent English settlement in America. The church itself was reconstructed on the stones of the foundation laid by the hardy colonists in the 1600's.

National Park Service

The First Brick State House Was Erected in Jamestown as the meeting place of the House of Burgesses. This was the first representative legislature in America. This well-preserved foundation is all that remains of the historic structure.

minders of the original settlement. The land around the church is now controlled by the Association for the Preservation of Virginia Antiquities. The rest of the site is owned by the National Park Service and forms a part of the Colonial National Historical Park. G.G.Do.

Related Subjects. The reader is also referred to:

Bacon's Rebellion	Smith, John
London Company	Virginia (History)
Pocahontas	Williamsburg
Rolfe, John	

JAMESTOWN, N.Y. (population 43,354). This beautiful resort and industrial city is one of the large furniture-manufacturing centers of the East. The city is located at the southeastern tip of Chautauqua Lake, where the internationally famous Chautauqua summer school is conducted.

Jamestown has many wood-furniture factories. Other Jamestown plants manufacture textiles, metal furniture, automobile parts, tools, washing machines, voting machines, ball bearings, and metal equipment.

The city owns and operates the electric and water plants. It is on the main line of the Erie Railroad and also is served by a branch of the New York Central. Jamestown was named in honor of James Prendergast, its first settler. The town was founded in 1810. It was incorporated as a village in 1827. Cabinet makers from Sweden settled in the village in the 1850's and established Jamestown as a furniture-making center. It received its charter as a city in 1886. W.E.Y.

JAMESTOWN COLLEGE is a coeducational liberal arts school at Jamestown, N.D. It is controlled by the Presbyterian Church, but students of all faiths are admitted. Courses offered include premedical, pre-engineering, prelaw, predental, and prenursing. Jamestown was founded in 1883, but was closed from 1893 to 1909. It has an average enrollment of about 500.

JAMSHEDPUR. See INDIA (Cities).

JANICULUM, *jah NICK yu lum,* **HILL.** See ROME (Location, Size, and Description).

JANIS, ELSIE (1889-), is an American actress who became popular in vaudeville when she was still a child. Later she was successful in comedy drama and musical comedy. Her clever imitations delighted audiences. Her experiences as an entertainer during World War I were the basis for *Elsie and Her Gang*, a wartime revue which she wrote and in which she acted.

Culver

Elsie Janis, American actress, was a very popular entertainer in World War I.

She was born in Columbus, Ohio. Her name was originally Bierbower. She adopted her mother's first name of Janis for the stage. Her own story of her life, *So Far, So Good*, was published in 1932. B.M.

Her Roles included leading parts in *The Vanderbilt Cup; The Hoyden; The Fair Co-ed; The Slim Princess;* and *The Lady of the Slipper.*

JANITOR is a person who takes care of a school, office, public, or apartment building. The name comes from that of the Roman god *Janus*, who guarded the gates of Rome and was two-faced so that he could see in both directions. The word *janitor* is now being replaced by the term *custodian.*

JANIZARY, *JAN ih ZAIR ih,* was the name for a soldier who belonged to a special body of Turkish infantry. In Turkish the word *Janizary* means *new troops.* The Janizaries, or *Janissaries,* were professional soldiers, organized in the 1300's by Orkhan, founder of the Ottoman Empire. He trained them in the Islamic religion and in warfare. Their ranks were filled by slaves, picked native troops, and sons of captured Christians. They served the Turkish rulers until 1826, when they revolted and were ruthlessly put down. The use of Janizaries in Turkish infantry ended with the revolution, when they were replaced by regular troops. W.F.McD.

JANUARY, the first month of the year, is named for Janus, the Roman god of beginnings. The festival of Janus was celebrated at the beginning of each year. The Norsemen named the month for Thor, their god of thunder and storms. In England, more than a thousand years ago, the Anglo-Saxons called it "Wolf-month" because fierce wolves entered the villages in search of food during this cold month.

In most parts of the northern half of the world, January usually is the coldest month of the year. In the southern half of the world, it is usually the warmest.

Activities. In the northern regions, most activities in the world of nature are quiet during January. The birds travel less than during any other month. Many animals, such as bears and woodchucks, are spending the days and nights fast asleep in their dens and burrows. Plants which live from year to year are resting in preparation for the next growing season. In Texas, Florida, and other Southern States, where the climate is mild, the growing of fruits and vegetables is already under way.

Special Days. January has one holiday which is observed in all Christian countries—New Year's Day. In India, China, and some other parts of the world, the beginning of the year is celebrated in other months because the calendars are different. Before England and the British colonies in America adopted the Gregorian calendar in 1752, the New Year was celebrated there on March 25. (See CALENDAR.)

Another important day in January is the feast of the Epiphany. It is observed by Roman Catholic, Episcopal, and Eastern churches on January 6, the twelfth day and twelfth night after Christmas. It is sometimes called Twelfth Night or Little Christmas, and frequently is a time for giving presents.

January 19 is a legal holiday in many Southern States,

Chicago Boys Club

January in the Northern States usually brings ice and snow, which forms an icy wonderland for winter sports.

since it is the birthday of Robert E. Lee, the great Confederate general.

History of January. One of the early Roman calendars began with March and had only ten months. According to legend, January was added to the calendar about 700 B.C. by Numa Pompilius, the second king of Rome. He gave the month only thirty days, but in 46 B.C., Julius Caesar increased the number to thirty-one.

Popular Beliefs. English girls once believed that they could see their future husbands in their dreams on the Eve of Saint Agnes, the night of January 20. Before going to bed they were supposed to do certain things. Some of them stuck pins in their sleeves and recited religious verses. Others fasted all day on January 20, and that night ate only an egg filled with salt.

Another common belief was that the first three days of January foretold the weather for the next three months. Some persons also believed that if there were thunder during January snow would fall the following May.

January Symbols. The snowdrop is the special flower for the month. It is one of the earliest flowers of the year, and often blooms in the snow. The garnet is the January gem. G.Hum.

Related Subjects. The reader is also referred to:

Agnes, Saint	New Year's Day
Epiphany	Snowdrop
Garnet	Thor
Janus	Twelfth Night

Birthdays of Famous Persons

1. Paul Revere, 1735, Revolutionary patriot.
   Anthony Wayne, 1745, hero in Revolutionary War.
   Betsy Ross, 1752, credited with making the first United States flag.
   Bartolomé Murillo, 1617, Spanish painter
2. Nathaniel Bacon, 1647, Virginia colonial leader.
   James Wolfe, 1727, British conqueror of Quebec.
   Philip Freneau, 1752, poet of the Revolution.
   Henry M. Flagler, 1830, Florida railroad builder.
   William Lyon Phelps, 1865, American educator.
3. Lucretia Mott, 1793, woman's-rights leader.
   Cicero, 106 B.C., Roman statesman and philosopher.
   Father Joseph Damien, 1840, Belgian missionary to lepers.
4. Louis Braille, 1809, inventor of reading method for the blind.
   Charles James Fox, 1749, English statesman and orator.
   Jacob Grimm, 1785, German collector of fairy tales.
5. Stephen Decatur, 1779, American naval hero.
6. Joan of Arc, 1412, French heroine of Orleans.
   Carl Sandburg, 1878, American poet and author.
   Charles Sumner, 1811, antislavery leader.
7. Millard Fillmore, 1800, thirteenth President of the United States.
   Israel Putnam, 1718, Revolutionary commander.
9. Carrie Chapman Catt, 1859, woman-suffrage leader.
10. Ethan Allen, 1738, leader of the Green Mountain boys.
11. Ezra Cornell, 1807, founder of Cornell University.
    Alexander Hamilton, 1757, first Secretary of the Treasury.
    William James, 1842, American psychologist.
    Sir John Macdonald, 1815, first premier of Canada.
12. John Winthrop, 1588, first governor of the Massachusetts Bay Colony.
    Edmund Burke, 1729, British writer and orator.
    Joseph Jacques Joffre, 1852, French commander in chief in World War I.
    J. H. Pestalozzi, 1746, pioneer Swiss educator.
    John Singer Sargent, 1856, American painter.
13. Salmon P. Chase, 1808, antislavery leader and Chief Justice of the United States Supreme Court.
14. Benedict Arnold, 1741, American Revolutionary general and traitor.
    Carlos Romulo, 1901, statesman of the Philippines.
15. Jean Baptiste Poquelin (Molière), 1622, French dramatist.
16. Robert W. Service, 1874, the poet of the Yukon.
17. Anton Chekhov, 1860, Russian author and playwright.
    Benjamin Franklin, 1706, Revolutionary patriot, diplomat, philosopher, author, humorist, scientist, and inventor.
    David Lloyd George, 1863, British statesman.
    Glenn Martin, 1886, American aviation pioneer.
18. Daniel Webster, 1782, American orator and statesman.
19. Sir Henry Bessemer, 1813, inventor of the Bessemer process for making steel.
    Paul Cézanne, 1839, French painter.
    Robert E. Lee, 1807, commander in chief of the armies of the Confederacy.
    Edgar Allan Poe, 1809, American poet and story writer.
    James Watt, 1736, Scottish engineer who invented an improved steam engine.
20. Mischa Elman, 1891, American violinist.
    Joseph Hofmann, 1876, American pianist.
21. John Fitch, 1743, inventor of a steamboat.
    John C. Frémont, 1813, explorer of the West.
    Thomas Jonathan, "Stonewall" Jackson, 1824, Confederate general.
22. André Marie Ampère, 1775, French physicist who pioneered in the study of electricity.
    Francis Bacon, 1561, English author and philosopher
    George Gordon, Lord Byron, 1788, English poet.
23. John Hancock, 1737, first signer of the Declaration of Independence.
24. Edith Wharton, 1862, American novelist

25. Robert Burns, 1759, Scottish poet.
26. Douglas MacArthur, 1880, American general and defender of the Philippines.
27. Samuel Gompers, 1850, pioneer American labor leader.
    Wolfgang Amadeus Mozart, 1756, German composer.
    William II, 1859, German emperor during World War I.
28. Charles George Gordon, 1833, hero of Khartoum.
    Sir Francis Drake, about 1540, first Englishman to sail around the globe.
29. William McKinley, 1843, twenty-fifth President of the United States.
    Thomas Paine, 1737, American philosopher and author.
    John Davison Rockefeller, Jr., 1874, business leader.
30. Walter Damrosch, 1862, music conductor and composer.
    Franklin D. Roosevelt, 1882, thirty-second President of the United States.
31. Irving Langmuir, 1881, Nobel prize winner in chemistry.
    Gouverneur Morris, 1752, Revolutionary statesman.
    Anna Pavlova, 1885, Russian dancer.
    Franz Schubert, 1797, German composer.

Notable January Events

1. U.S. parcel post service begun, 1913.
   First homestead granted, 1863.
   Ireland became a part of Great Britain, 1801.
   Lincoln issued Emancipation Proclamation, 1863.
   Commonwealth of Australia proclaimed, 1901.
2. Georgia ratified the Constitution, 1788.
   Port Arthur surrendered to the Japanese, 1905.
3. Battle of Princeton, 1777.
4. Utah admitted to Union, 1896.
6. New Mexico admitted to the Union, 1912.
7. La Salle began his last journey through Mississippi Valley, 1687.
   Petroleum-cracking process invented by William M. Burton, 1913.
   Transatlantic commercial telephone service begun, New York to London, 1927.
   First presidential election held in United States, 1789.
8. Battle of New Orleans, 1815.
   President Wilson laid his "Fourteen Points" before Congress, 1918.
9. Connecticut ratified the Constitution, 1788.
   First balloon ascent made in America, 1793.
10. Treaty of Versailles ratified by Allies and Germany, 1920.
    League of Nations established, 1920.
14. Norway was united with Sweden, 1814.
15. Vermont declared its independence, 1777.
    British Museum opened, 1759.
16. France recognized the independence of the United States, 1778.
    Eighteenth Amendment ratified, 1919.
20. Daniel Webster gave his famous reply to Hayne in the United States Senate, 1830.
21. Execution of Louis XVI of France, 1793.
22. Edward VII became king of England, 1901.
24. Gold discovered at Sutter's Fort in California, 1848.
    First Boy Scout troop organized in England, 1908.
    Prussia annexed Schleswig-Holstein, 1867.
25. Transcontinental telephone service established in the United States, 1915.
26. Michigan admitted to the Union as the twenty-sixth state, 1837.
27. Thomas Edison was granted a patent for his incandescent light, 1880.
    Canadian Great Western Railway opened, 1854.
29. Kansas admitted to the Union, 1861.
30. Jefferson's library purchased by Congress to replace Congressional Library burned by the British, 1815.
    Hitler named chancellor of Germany, 1933.
    Federal Gold Reserve Act passed, 1934.
    Charles I beheaded, 1649.

Quotations for January

Ring out the old, ring in the new,
Ring, happy bells, across the snow;
The year is going, let him go;
Ring out the false, ring in the true. *Tennyson*

Blasts of January would blow you through and through. *Shakespeare*

Now there is frost upon the hill
And no leaf stirring in the wood;
The little streams are cold and still;
Never so still has winter stood. *George O'Neil*

The wind is abroad and the snow is flying;
Up and out in the frosty light!
This is no time to be lazily lying,
When the world is silver and white. *Edith Ballinger Price*

Saint Agnes' Eve — Ah, bitter chill it was!
The owl, for all his feathers, was a-cold;
The hare limped trembling through the frozen grass,
And silent was the flock in wooly fold. *Keats*

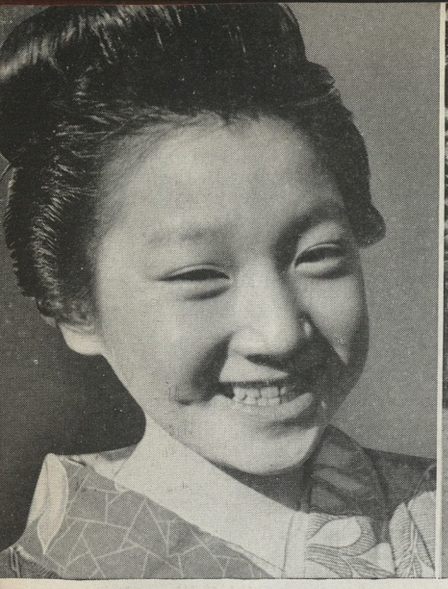
JANUS, *JAY nus*, was the god of doors and gates in Roman mythology. He was also the god of the beginnings of things. People prayed to him when they were about to start something new. The month of January was named after him, and he was especially worshiped on the first day of the year.

Janus is usually represented with two faces, one turned to the front and one to the back. This was so that no one could enter the gates of Rome without his knowing it. His temple doors in Rome were open during

Janus Was a Two-faced Roman God for whom the month of January was named. He stood guard at the gates of Rome.

war and closed during peace. He was also looked on as a god of traffic on land and sea. In art, Janus is shown carrying keys and a staff. P.Col.

JAPAN. See Japanning.



Fritz Henle; Ewing Galloway

JAPAN. An old Japanese legend tells that Amaterasu-O-Mi-Kami, the Goddess of the Sun, once let four dew drops fall from her scepter. The story says that the four main islands of Japan were formed when the drops of dew fell into the sea. The Japanese call their country NIPPON, or NIHON, which means *home of the sun*. Westerners often call Japan *The Land of the Rising Sun*.

Japan is like Great Britain in several ways. Like the British Isles, Japan is a group of islands lying off the coast of a large continent. Also like Great Britain, Japan built much of its power on the sea. Before World War II, Japan's large merchant fleet visited all the ports of the earth and the Japanese Navy became the third largest in the world. The main problem of Japan and Great Britain has been much the same—how to support a large population on small islands. Japan tried to solve this problem in much the same way that Great Britain did, by building an overseas empire.

Japan took many colonies on the Asiatic continent and among Pacific islands. Japan also tried to gain control of East Asia and fought two wars with its strongest neighbor, China. Japan did all these things within the short space of about eighty years. But at the end of World War II, it had lost all it had won.

Before World War II, Japan had a large trade with foreign countries. It was the largest buyer of raw cotton from the United States. The United States in turn bought most of its silk from Japan. Japan also supplied the world with many toys, dishes, and other small objects. Countries were eager to buy low-priced Japanese products, which were cheap because Japanese labor was cheap. World War II cost Japan much of this trade.

Many Japanese contributions to the world are lasting. Japanese art is admired by many people. Japanese architecture has given many ideas to Western builders of homes. Japanese doctors and scientists have made valuable discoveries.

The Land and Its Resources

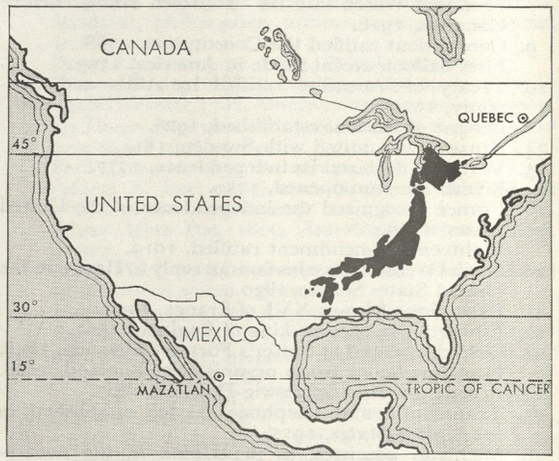
Extent: *Area*, 142,338 square miles. *Coast line*, 12,499 miles, irregular and broken with many harbors.

Physical Features: *Chief mountain ranges*, Hida, also called Central Mountain Knot and Japanese Alps; Nasu volcanic chain. *Chief peaks*, Fujiyama, known also as Fuji, Fujisan, and Huzizan, 12,394 feet; Bandaisan, 6,481 feet; Ontakesan, 10,046 feet; Tateyama, 9,184 feet. *Chief rivers*, Ishikari, Sumida, Kiso, Shinano. *Chief lakes*, Biwa, Kussharo. *Chief bays*, Tokyo, Sagami, Suruga, Ise, Osaka, Kagoshima.

Location, Size, and Surface Features. Japan is made up of four main islands—Hokkaido on the north, the main island of Hondo, or Honshu, and Shikoku and Kyushu on the southwest. There are hundreds of small islands along the coasts. Two small groups of islands are part of Japan. One group runs about 50 miles south of Kyushu, and the other runs about 300 miles south of Tokyo Bay. Japan has an area of 142,338 square miles, a little larger than the size of Iowa and Minnesota.

The Japanese islands are part of a great sunken mountain range which circles the northern Pacific Ocean. The mountains of Alaska and the Aleutian Islands are also part of this range. So are the Philippine Islands. The Ryukyu Islands to the south of Japan and the Kurile Islands to the north are also part of this chain.

Seven eighths of the surface of Japan is covered with mountains. There are a few broad plains on the islands. The Kwanto plain starts at the top of Tokyo Bay and



How the Area of Japan (in black) compares with that of the United States. This map shows only the home islands of Japan. It does not include Korea (Chosen), Formosa, the southern half of Sakhalin (Karafuto), and other smaller islands taken from the Japanese Empire at the end of World War II.

extends almost across Honshu Island. The Kwansai Plain in west-central Honshu gives room for the great cities of Osaka, Kobe, and Kyoto. Nagoya is on the smaller Nogi Plain. But most of Japan slopes up from the sea to hills, plateaus, and high peaks.

Japan parallels the coast of northeastern Asia. The Sea of Japan separates Hokkaido and Honshu from the continent. The Straits of Tsushima, about 100 miles wide, runs between Japan and Korea. The East China Sea lies between western Japan and China. For the boundaries of Japan, see the colored map.

The most important features of the Japanese islands are the mountains. Among them are more than 500 volcanoes. About sixty of these have been active within historic times. These mountains are beautiful and have been an inspiration for Japanese painters and poets. But they crowd the islands so that there is room for little else. Farms are very small, and cities are very large and crowded. The many mountains have made the building of roads and railroads difficult.

One of the highest and best-known Japanese mountains is Fujiyama, or Fujisan, which means *peerless mount*. It is an inactive volcano which rises to a height of 12,395 feet above sea level. Active volcanoes in Japan include Asamayama, Sakurajima, and Oshima. Many Japanese have committed suicide by plunging into the boiling crater of Oshima.

Rivers, Lakes, and Bays. Thousands of small streams flow down the mountainsides, but there are no large rivers. Boats can not sail for any distance on any of the rivers. The Ishikari in Hokkaido is the longest river, with a course 227 miles long. In some of the large cities, such as Toyko and Osaka, there are many canals, which are used by flat-bottomed boats.

There are many lakes in Japan. Some have formed in the craters of dead volcanoes, and others in mountain valleys. The largest is Lake Biwa, northeast of Kyoto in central Honshu. There are many summer resorts on the shores of the lakes. There are also many hot springs in all parts of Japan, where Japanese go to rest and take baths. On the island of Shikoku, there are several geysers and hot mud springs, much like those found in Yellowstone Park.

Japan has a sea of its own, the Inland Sea, between Honshu on the north and Kyushu and Shikoku on the south. This has always been an important waterway for the Japanese. The sea has long been known to tourists for its beautiful waters dotted by small wooded islands.

The hundreds of bays and inlets along Japan's coast provide many excellent harbors. Overland communication in Japan is difficult, and most of Japan's cities are on or near the sea. For these reasons there has always been much shipping between coastal ports. The largest bay is Tokyo Bay, over thirty miles long. Only the southwestern part of the bay is deep enough for large ships, but the bay is large enough to hold the entire United States Navy. Other large bays are Izu Bay near Nagoya, Muroran Bay in Hokkaido, and Nagasaki and Kagoshima bays in Kyushu.

Coast Line. The coast line of Japan is broken, and has more than 1,400 harbors. It is also very long compared with the area of the islands. There are 12,449 miles of shore line in the islands, or one mile for every eight and a half square miles of area. This is almost twice as much coast line as England has. As a result, no spot in Japan is more than 100 miles from the sea.

Earthquakes. Scientists believe that Japan is a mountain range that has not yet stopped growing. They say that the eastern shores of the islands along the Pacific Ocean are slowly rising, while the western coast along the Sea of Japan is sinking. Because of this movement of the earth's crust, there are many earthquakes in Japan. There are about 1,500 earthquakes in the islands each year, most of them not serious. But the earthquake of 1896 in northern Honshu killed 27,122 persons. And the Tokyo-Yokohama earthquake of 1923 destroyed or damaged 694,621 homes and killed 44,279 persons.

Climate. The climate of Japan is influenced by the ocean currents which flow near it and the winds that blow over it. Two great ocean currents pass the Japanese coast. The Japan Current, which the Japanese call the *Kuroshio*, or Black Current, starts north of the Philippines and flows north along the south and east coasts of Japan. It is a warm current and makes southern Japan warmer than places in Asia which are no farther south. East of Japan, this current meets the Kurile Current, from the cold waters of the Sea of Okhotsk and the Bering Sea. This current makes northern Japan cold.

The winds of Japan follow the pattern of the Asiatic *monsoon*. (See MONSOON.) During the winter, dry cold winds blow in from the northwest, from the high plains of Manchuria and Mongolia. In the summer, warm moist air comes in from the southeast, over the Pacific.

Climate in northern and southern Japan is very different. Southern Kyushu is hot and damp. Hokkaido, to the north, has very cold winters with heavy snowfall. The climate of central Japan, around Tokyo, is mild. It is seldom very cold in winter and snowfall is light. But summers are very warm and the air is damp and muggy. Most Europeans who live in Tokyo or other cities in central Japan try to go to the mountains in the summertime. Much rain falls during the summer. The rainfall of Tokyo averages 63 inches a year. As much as 125 inches a year falls in the mountains facing the Pacific.

Japan is in the path of the typhoons, the great windstorms which start in the west central Pacific. Several typhoons usually hit Japan each year, and they often do much damage.

Natural Resources. Japan is very poor in natural resources. Its most precious possession is the soil. Mountains take up so much space that only about one acre in seven can be farmed. The small amount of farm land is used carefully. The rest of the land below the top of the highest mountains is taken up with forests. There is little grazing land except in Hokkaido. The best farm land in Japan is in the river valleys. The volcanic soil of the mountainsides is not good for raising crops. Even the best land is so worn out from hundreds of years of farming that farmers must use a great deal of fertilizer.

The forests of Japan's mountains are a great national treasure. Before World War II, about 7 per cent of all forests were owned by the Emperor and trees on the Imperial lands were not cut. But the rest of the trees were used for lumber and for making charcoal, which is the principal Japanese home fuel. Many of the forests are of evergreen trees, but there are also maples, oak, and

other hardwoods. The giant Cryptomeria is one of the prized trees of Japan.

Bamboo grows widely as far north as northern Honshu. It has many uses. Long bamboo poles are used in building houses. People and animals eat bamboo shoots. Bamboo stalks make fishing poles and the roofs of houseboats, or sampans. (See SAMPAN.) The long narrow stalks are split and woven into mats and rugs, baskets, and luggage. Hundreds of acres of Japanese lands have been planted in mulberry trees. The leaves of mulberry trees are used to feed silkworms. During wartimes many of the mulberry trees are cut down to make room for food crops. Fruit trees are important. There are apple trees in northern Japan, and pear and orange trees grow in central and southern Japan. The famed Japanese cherry trees do not bear fruit. Japanese gardens are lovely with purple and white wisteria, and with the glowing colors of chrysanthemums.

The animal life of Japan is varied. The black bear, monkey, martin, weasel, and flying squirrel are found on the main islands. Here also are the fox and badger, which are characters in many old Japanese tales. The fox was believed to be the messenger of the harvest god, and the badger was thought to be a mischief-maker. Nightingales sing in the forests of Japan.

Japan's richest resources in animal life are the fish off the islands' shores. The Japanese coastal waters are the most important fishing grounds in the world. In the winter great schools of fish from the Sea of Okhotsk, off Siberia, travel south to the warm waters of Japan. In the summer, fish from the south seek the coasts of Japan. Their large numbers have made fish one of the most important items in the Japanese diet. The Japanese also harvest large amounts of seaweed for food and for medicine.

Japan has many mineral resources but not enough for its industrial needs. This lack was one of the reasons Japan gave for its campaign of expansion. Only coal, copper, gold, silver, and sulfur are present in large quantities. Gold and sulfur are the only minerals present in greater quantities than Japan needs for its own uses. There is very little oil. Lead, zinc, salt, and iron are far short of Japan's needs. Japan has a fair amount of coal. It is chiefly bituminous and of medium quality. About two thirds of it is in Kyushu, and one third in Hokkaido. Special coking coals for industrial use must be imported. Japan has no natural gas, nickel, aluminum, or magnesium.

Conservation. The Japanese have done much in forest conservation, both to provide future timber and to control floods. The cutting of trees is spaced and new trees are planted. To control floods, forests have been planted on unprotected areas to keep the ground from washing away, and near river sources where moisture should be preserved.

Japan's rivers are short and are not useful in navigation, but they have considerable value. They fill mountain reservoirs with pure water for the use of the large cities of the coast. Their fast-flowing current and many waterfalls supply cheap hydroelectric power for factories and cities. Even the villages of Japan have electricity, and most railroads are electric-powered. The rivers also supply the water for irrigating Japan's rice fields. There are no large irrigation projects in Japan, but small, primitive systems are operated by the farmers.

The People and Their Work

Population: 83,199,637. *Density*, about 563 persons per square mile. *Distribution*, urban, 54 per cent; rural, 46 per cent.

Chief Products: *Agricultural*, rice, barley, wheat, soybeans, raw silk, tea, bamboo. *Fishery*, sardines, salmon, trout, herring, mackerel, tuna, crabs, whales, fish products. *Manufactured*, cotton and silk materials, chemicals, dyes, rayon, soap, paper, paint, iron and steel products. *Mineral*, coal, iron, pyrite, copper, silver, manganese.

The People. The ancestors of the modern Japanese came from many places. The first inhabitants of Japan were a people called the Ainu. These dark, hairy people were slowly pushed northward as other people came to the islands. Today the only Ainu are in Hokkaido, and they number only about 16,000.

The rest of the Japanese are descendants of people who came many hundreds of years ago from Korea and North China, and from the Philippines and South China. So the Japanese are a mixture of Mongol and Malay. They look somewhat like the Chinese. They have yellowish skin, straight black hair, dark eyes with slanting eyelids, and broad, prominent cheekbones. Most Japanese men have heavier beards than the Chinese. The Japanese tend to be short and squat. Their legs are usually short in proportion to their bodies, and many Japanese are bow-legged.

Some scientists believe the Japanese diet and way of living have great influence on the Japanese body structure. They believe the meager Japanese diet keeps them small, and that Japanese legs are short and bowed because of the custom of sitting crosslegged on the floor. Japanese who are born and live abroad, eat Western food, and sit on chairs, are generally taller and have longer and straighter legs than the Japanese who live in Japan.

Ways of Life. The Japanese way of living is very different from that of Europeans and Americans. The Japanese have adopted many Western products and inventions, but they still live much as their grandfathers did.

The Japanese run their lives according to strict rules of etiquette. They have great love of form, and make ceremonies of doing the simplest things in life. As children, Japanese are taught to control their feelings. Japanese will laugh when talking with friends, but they do not consider it fitting to show their emotions in public.

The Japanese women are very restrained in their actions. They are taught to consider themselves below the social level of men, and to be quiet and obedient. When they are children, they must obey their fathers. When they marry, their husbands are their masters. If their husbands die, they must obey their oldest sons. Japanese custom has decreed that most Japanese women may not appear in public places such as dance halls and night clubs. The men who go to such places find female companionship in the company of *geishas*, who are young women hired as professional entertainers. After the Japanese surrender at the end of World War II, the Allied authorities took steps to improve the lot of Japanese women and to give them equal rights with men.

The Japanese are great lovers of beauty, particularly in nature. They are fond of their gardens, and they often

JAPAN

Population...83,199,637

Cities

Abashiri, 39,218 ..... D12
Agematsu, 9,031 ..... n16
Aho, 3,210 ..... o15
Aikawa, 8,509 ..... G 9
Ajigasawa, 6,479 ..... F10
Akashi, 65,642 ..... I 7
Akechi, 4,148 ..... n16
Aki, 12,452 ..... J 6
Akita, 126,074 ..... G10
Akkeshi, 15,066 ..... E12
Anjō, 35,188 ..... o16
Aomori, 106,417 ..... F10
Arai, 12,528 ..... o16
Asahigawa, 123,238 ..... E11
Ashikaga, 52,810 ..... H 9
Ashio, 18,994 ..... H 9
Asuke, 4,435 ..... n16
Atami, 34,509 ..... n18
Atsugi, 10,989 ..... n18
Atsuma E10
Ayabe, 33,573 ..... n14
Beppu, 93,033 ..... J 5
Chiba, 133,844 ..... I10, n19
Chichibu, 31,510 ..... n18
Chikura, 9,859 ..... o18
Chōshi, 73,512 ..... I10, n19
Echigawa, 7,159 ..... n15
Embetsu, 8,227 ..... D10
Engaru, 16,026 ..... D11
Enzan, 14,764 ..... n17
Esashi, 9,862 ..... F10
Esashi, 10,518 ..... D11
Fujimi n17
Fukuchiyama, 45,085 ..... I 7, n14
Fukue, 15,802 ..... o16
Fukui, 100,691 ..... H 8
Fukuoka, 6,969 ..... F10
Fukuoka, 392,649 ..... J 5
Fukushima, 93,435 ..... H10
Fukushima, 9,087 ..... I 8, n16
Fukuyama, 6,705 ..... F10
Fukuyama, 67,063 ..... I 6
Funabashi, 83,348 ..... n19
Funakawaminato, 16,865 ..... G 9
Funazu, 24,868 ..... m16
Furano, 20,345 ..... E11
Furukawa, 8,616 ..... H 8, m16
Fuse, 150,129 ..... I 7 O14
Futamata, 10,493 ..... o16
Gamagōri, 26,080 ..... o16
Gero, 6,134 ..... n16
Gifu, 211,845 ..... I 8, n15
Gojō, 12,796 ..... o14
Gotemba, 12,981 ..... n17
Haboro, 17,664 ..... D10
Hachiman, 10,211 ..... n15
Hachinohe, 104,335 ..... F10
Hachiōji, 82,539 ..... I 9, n18
Hagi, 41,613 ..... I 5
Hakodate, 228,994 ..... F10
Hamada, 40,440 ..... I 6
Hamamatsu, 152,028 ..... I 8, o16
Hamatombetsu D11
Handa, 62,860 ..... o15
Hashimoto, 9,460 ..... o14
Hikone, 49;207 ..... n15
Himeji, 212,100 ..... I 7
Hiratsuka, 52,381 ..... I 9, n18
Hiraya n14
Hirosaki, 65,597 ..... F10
Hiroshima, 285,712 ..... I 6
Hitachi, 56,066 ..... H10
Hitoyoshi, 45,169 ..... J 5
Hōfu, 71,065 ..... I 5
Hokōda, 6,285 ..... m19
Hom-mura, 4,550 ..... o18
Ichikawa, 102,506 ..... n18
Ichinomiya, 71,431 ..... n15
Iida, 32,684 ..... I 8, n16
Iijima n16
Ikeda, 45,177 ..... o14
Imabari, 60,191 ..... I 6
Imazu, 5,913 ..... n15
Ina, 23,273 ..... n16
Inatori, 8,113 ..... o18
Ine n14
Isahaya, 65,434 ..... J 5
Isezaki, 48,703 ..... H 9, m18
Ishinomaki, 52,351 ..... G10
Ishioka, 25,769 ..... m19
Itami, 56,348 ..... o14
Itō, 36,137 ..... o18
Iwakuni, 61,532 ..... I 6
Iwamisawa, 47,951 ..... E10
Iwamurada, 10,115 ..... m17
Iwanai, 23,319 ..... E10
Iwaya, 9,783 ..... o14
Izuhara, 10,021 ..... I 4
Kagoshima, 229,462 ..... K 5
Kainan, 35,140 ..... I 7
Kaizuka, 53,586 ..... o14
Kajikazawa, 5,757 ..... n17
Kakegawa, 17,137 ..... o17
Kamaishi, 35,231 ..... G10
Kamakura, 85,391 ..... n18
Kameoka, 9,736 ..... o14
Kanaiwa ..... H 8
Kanayama, 3,326 ..... n16
Kanazawa, 252,017 ..... H 8
Kanoya, 63,506 ..... K 5
Karatsu, 51,820 ..... J 4
Kashima, 3,678 ..... n19
Kashiwazaki, 38,142 ..... H 9
Kasukabe, 14,922 ..... n18
Kasumi, 8,478 ..... I 7
Katata, 7,646 ..... n14
Katsuyama, 18,196 ..... m15
Kawagoe, 52,820 ..... n18
Kawaguchi, 124,783 ..... n18
Kawasaki, 319,226 ..... I 9, n18
Kesennuma, 21,313 ..... G10
Kinomoto, 6,367 ..... n15
Kinosaki, 3,972 ..... I 7
Kiryū, 95,533 ..... H 9, m18
Kisarazu, 37,901 ..... n18
Kitamaki m17
Kōbe, 765,435 ..... I 7, n14
Kōchi, 161,640 ..... J 6
Kōfu, 121,645 ..... I 9, n17
Koga, 30,709 ..... m18
Kokura, 199,397 ..... J 5
Komatsu, 63,201 ..... H 8
Komatsushima, 26,233 ..... I 7
Kominato, 4,237 ..... n19
Kōriyama, 70,866 ..... H10
Koromo, 31,996 ..... n16
Kōwa, 9,347 ..... o15
Kuge n14
Kuji, 10,315 ..... F10
Kuki, 8,384 ..... m18
Kumagaya, 65,487 ..... m18
Kumamoto, 267,506 ..... J 5
Kumihama, 2,710 ..... n14
Kurashiki, 53,301 ..... I 6
Kure, 187,775 ..... I 6
Kurume, 100,997 ..... J 5
Kusatsu, 10,874 ..... n14
Kushiro, 93,357 ..... E12
Kuwana, 40,595 ..... I 8, n15
Kyōto, 1,101,854 ..... I 7, n14
Maebashi, 97,394 ..... H 9, m18
Maizuru, 91,914 ..... I 7, n14
Makurazaki, 34,480 ..... K 5
Mamba, 6,891 ..... m17
Marugame, 37,312 ..... I 6
Matsue, 74 018 ..... I 6
Matsuida, 5,979 ..... m17
Matsumoto, 86,005 ..... H 9, m16
Matsuyama, 163,859 ..... J 6
Matsuzaka, 48,743 ..... I 8, o15
Matsuzaki, 5,708 ..... o17
Minamata, 43,661 ..... J 5
Minato, 20,274 ..... m19
Minato, 4,824 ..... n18
Mino, 11,169 ..... n15
Misaki, 19,334 ..... n18
Misakubo, 9,122 ..... n16
Mishima, 47,333 ..... I 9, n17
Mitake, 3,764 ..... I 8, n16
Mito, 67,163 ..... H10, m19
Miyako, 39,255 ..... G10
Miyakonojo, 75,114 ..... K 5
Miyazaki, 103,443 ..... K 5
Miyazu, 15,300 ..... n14
Mobara, 15,411 ..... n19
Moji, 124,399 ..... J 5
Mombetsu, 23,046 ..... D11
Mori, 24,294 ..... E10
Morioka, 117,578 ..... G10
Motomura o18
Murakami, 15,711 ..... G 9
Muroran, 110,443 ..... E10
Nagano, 101,426 ..... H 9
Nagaoka, 66,818 ..... H 9
Nagasaki, 241,805 ..... J 4
Nagoya, 1,030,635 ..... I 8, n15
Nakatsu, 51,410 ..... J 5
Nakatsu, 23,451 ..... n16
Nakiri, 7,129 ..... o15
Nanao, 40,002 ..... H 8
Nara, 77,866 ..... o14
Narai n16
Narita, 13,765 ..... n19
Nayoro, 23,131 ..... D11
Neba n16
Nemuro, 20,222 ..... E12
Niigata, 220,901 ..... H 9
Niihama, 57,421 ..... J 6
Niimi, 7,596 ..... I 6
Nikko, 29,363 ..... H 9
Nirasaki, 9,533 ..... n17
Nobeoka, 88,117 ..... J 5
Noboribetsu E10
Nōgata, 53,638 ..... J 5
Noheji, 16,521 ..... F10
Nokkeushi, 45,952 ..... E11
Noshirominato, 49,027 ..... F10
Numazu, 101,976 ..... I 9, n17
Oami, 4,268 ..... n19
Obama, 16,668 ..... n14
Obihiro, 51,794 ..... E11
Odawara, 75,334 ..... I 9, n18
Ōgaki, 74,811 ..... I 8, n15
Ohara, 11,765 ..... n19
Oita, 94,455 ..... J 5
Okaya, 35,520 ..... H 9, m17
Okayama, 162,904 ..... I 6
Okazaki, 96,030 ..... o16
Omigawa, 8,820 ..... n19
Ominato, 14,424 ..... F10
Omiya, 100,093 ..... I 9, n18
Omiya, 42,750 ..... n17
Omuta, 191,978 ..... J 5
Ono, 17,711 ..... n15
Onomichi, 61,411 ..... I 6
Ōsaka, 1,956,136 ..... I 7, o14
Ōsaka, 6,652 ..... n16
Oshamambe, 13,401 ..... E10
Ota, 6,982 ..... n15
Otaki, 5,758 ..... n19
Otaru, 178,330 ..... E10
Otsu, 33,341 ..... o14
Otsu, 85,251 ..... o14
Ozu, 18,572 ..... J 6
Piuka, 13,390 ..... D11
Pombetsu, 15,425 ..... E11
Rumoe, 32,513 ..... E10
Ryōzu, 9,402 ..... G 9
Saeki, 39,776 ..... J 5
Saga, 66,807 ..... J 5
Sagara, 15,001 ..... o17
Saigō, 7,315 ..... H 6
Sakari, 4,478 ..... G10
Sakashita, 6,453 ..... n16
Sakata, 54,291 ..... G 9
Sanda, 7,981 ..... o14
Sanjō, 46,646 ..... H 9
Sapporo, 313,850 ..... E10
Sarufutsu D11
Sasebo, 194,453 ..... J 4
Seki, 4,914 ..... o15
Sendai, 341,685 ..... G10
Senhōshi D10
Senzu n17
Setana, 6,060 ..... E 9
Seto, 45,752 ..... I 8, n16
Shari, 15,356 ..... E12
Shibetsu, 20,880 ..... D11
Shimabara, 40,583 ..... J 5
Shimada, 32,193 ..... o17
Shimizu, 88,472 ..... I 9, n17
Shimoda, 5,146 ..... J 6
Shimoda, 8,865 ..... o17
Shimodate, 16,153 ..... m18
Shimonoseki, 193,572 ..... I 5
Shimotsuma, 10,335 ..... m18
Shingū, 33,827 ..... J 7
Shinjō, 31,140 ..... G10
Shinshiro, 9,697 ..... o16
Shiogama, 45,820 ..... G10
Shiojiri, 13,955 ..... m16
Shiratori, 5,819 ..... n15
Shishido, 11,018 ..... m19
Shizuoka, 238,629 ..... I 9, o17
Shūzenji, 7,746 ..... o17
Sonobe, 9,374 ..... n14
Sumoto, 37,323 ..... I 7
Sunagawa, 24,604 ..... E10
Suttsu, 5,573 ..... E10
Suzuka, 68,755 ..... o15
Tachikawa, 51,651 ..... n18
Taguchi, 5,261 ..... n16
Taira, 42,891 ..... H10
Tajimi, 38,477 ..... I 8, n16
Takada, 36,255 ..... H 9
Takamatsu, 124,545 ..... I 7
Yōsu 5,000 ..... I 3
Takaoka, 142,046 ..... H 8
Takasaki, 92,964 ..... H 9, m18
Takata, 6,991 ..... H 9
Takatō, 4,469 ..... n17
Takatsu, 22,059 ..... I 5
Takatsuki, 43,321 ..... o14
Takayama, 42,823 ..... H 8, m16
Takefu, 40,328 ..... n15
Takihara, 4,457 ..... o15
Tanabe, 37,602 ..... J 7
Tateyamahōjō, 37,291 ..... I 9, o18
Teshio, 9,091 ..... D10
Toba, 11,117 ..... o15
Tochigi, 42,248 ..... H 9, m18
Tokushima, 121,416 ..... I 7
Tōkyō, 5,385,071 ..... I 9, n18
Tomakomai, 39,226 ..... E10
Toride, 10,780 ..... n19
Tottori, 61,721 ..... I 7
Toyama, 154,484 ..... H 8
Toyohashi, 145,855 ..... I 8, o16
Toyonaka, 86,203 ..... I 7, o14
Tsu, 76,077 ..... I 8, o15
Tsuchiura, 62,246 ..... H10, m19
Tsurikake ..... E 9
Tsuruga, 31,092 ..... I 8, n15
Tsuruoka, 44,018 ..... G 9
Tsushima, 30,608 ..... n15
Tsuyama, 51,645 ..... I 7
Ube, 128,569 ..... J 5
Ueda, 42,778 ..... H 9, m17
Ueno, 46,503 ..... o15
Ujiyamada, 69,489 ..... I 8, o15
Ukusu o17
Urakawa, 13,994 ..... E11
Urawa, 115,019 ..... I 9, n18
Utsunomiya, 107,210 ..... H 9
Uwajima, 56,570 ..... J 6
Wajima, 15,604 ..... H 8
Wakamatsu, 60,034 ..... H 9
Wakayama, 191,337 ..... I 7, o14
Wakkanai, 34,529 ..... D10
Yagi, 8,323 ..... o14
Yaizu, 30,603 ..... o17
Yamagata, 104,891 ..... G10
Yamaguchi, 77,759 ..... I 5
Yatsushiro, 47,658 ..... J 5
Yawata, 210,051 ..... J 5
Yawatahama, 39,932 ..... J 6
Yoichi, 26,396 ..... E10
Yokkaichi, 123,870 ..... I 8, o15
Yokohama, 951,189 ..... I 9, n18
Yokoshiba, 6,571 ..... n19
Yokosuka, 250,533 ..... I 9, n18
Yokosuka, 8,362 ..... o16
Yokote, 26,988 ..... G10
Yonago, 58,661 ..... I 6
Yonezawa, 55,008 ..... H10
Yoshida n17
Yoshiwara, 33,313 ..... n17

KOREA

Population...29,291,000

Cities

Andong, 21,686 ..... H 4
Anju, 18,284 ..... G 2
Ansŏng, 5,000 ..... H 3
Aojidong ..... E 5
Changjin, 5,000 ..... F 3
Changsŏng (Shōfō) ..... F 2
Changyŏn, 5000 ..... G 2
Chasŏng, 5,000 ..... F 3
Chechŏn, 5,000 ..... H 4
Cheju, 36,260 ..... J 3
Chindo ..... I 3
Chinhae, 18,988 ..... I 4
Chinju, 86,852 ..... I 4
Chinnampo, 68,656 ..... G 2
Chochiwŏn, 10,000 ..... H 3
Chŏnan, 17,977 ..... H 3
Chŏngjin (Seishin), 197,918 ..... F 4
Chŏngju, 51,522 ..... H 3
Chongsŏng ..... E 4
Chŏnju, 83,333 ..... I 3
Chŏrwŏn, 20,744 ..... G 3
Chosan, 1,000 ..... F 2
Chunchŏn, 46,809 ..... H 3
Chungju ..... H 3
Haeju (Kaishu), 62,651 ..... G 2
Hamhŭng (Kankō), 75,320 ..... G 3
Hamyang ..... I 3
Hapsu ..... F 4
Hoeryŏng, 22,821 ..... E 4
Hongwŏn ..... F 3
Hŭichŏn, 5,000 ..... F 3
Hŭnghae ..... H 4
Hungnam, 85,000 ..... G 3
Hyesanjin ..... F 4
Hyŏpchŏn, 19,453 ..... I 4
Inchŏn, 215,784 ..... H 3
Iri, 21,335 ..... I 3
Iwŏn ..... F 4
Kaeryŏng, 5,000 ..... H 4
Kaesŏng (Kaijō), 87,962 ..... H 3
Kanggye, 17,898 ..... F 3
Kangnŭng, 5,000 ..... H 4
Kansŏng, 5,000 ..... G 4
Kapsan ..... F 4
Kilchu, 5,000 ..... F 4
Kongju, 12,054 ..... H 3
Konyang, 5,000 ..... I 3
Kosŏng, 5,000 ..... G 4
Kowŏn, 5,000 ..... G 3
Kŭmhwa ..... G 3
Kŭmsŏng, 5,000 ..... G 3
Kunsan, 66,715 ..... I 3
Kwangju, 100,451 ..... I 3
Kyŏngju (Keishū), 21,787 ..... I 4
Kyŏngsŏng ..... F 4
Maengsan ..... G 3
Manpojin, 1,000 ..... F 3
Masan, 82,175 ..... I 4
Mokpo, 103,081 ..... I 3
Munsan, 5,000 ..... H 3
Musan, 1,000 ..... E 4
Naesŏng, 5,000 ..... H 4
Najin (Rashin), 38,319 ..... E 5
Namwŏn, 14,814 ..... I 3
Nanam, 21,258 ..... F 4
Onsong ..... E 4
Panmunjom ..... H 3
Pohang, 15,250 ..... H 4
Pukchŏng, 5,000 ..... F 4
Pungsan ..... F 4
Pungsan ..... H 4
Puryŏng ..... E 4
Pusan (Fusan), 400,156 ..... I 4
Pyŏngchang ..... H 4
Pyongtaek ..... H 3
Pyŏngyang (Heijō), 285,965 ..... G 2
Saengchŏn ..... G 3
Sakchu, 5,000 ..... F 2
Sangju, 10,000 ..... H 4
Sariwŏn, 30,389 ..... G 2
Sasuri ..... F 3
Seoul (Keijō), 1,141,766 ..... H 3
Sinanju, 5,000 ..... G 2
Singye ..... G 3
Sinhŭng, 5,000 ..... F 3
Sinŭiju, 61,143 ..... F 2
Sŏnchŏn, 10,000 ..... G 2
Sŏngchŏn ..... G 3
Sŏngjin (Jōshin), 23,496 ..... F 4
Sŏsan ..... H 3
Sunchŏn, 5,000 ..... G 2
Sunchŏn, 23,660 ..... I 3
Taegu (Taikyū), 269,113 ..... I 4
Taejŏn 96,207 ..... H 3
Taeyudong, 5,000 ..... F 2
Tanchŏn, 5,000 ..... F 4
Tokchon, 5,000 ..... G 3
Ulchin ..... H 4
Ulsan, 15,587 ..... I 4
Unggi, 22,085 ..... E 5
Unsan ..... G 2
Wando ..... I 3
Wiwŏn ..... F 3
Wŏnsan (Gensan), 79,320 ..... G 3
Yangyang ..... G 4
Yŏngan ..... F 4
Yŏngchŭng, 10,000 ..... G 3

Physical Features

Akaishi-Sammyaku (Mts.) n17
Akuseki (Isl.) ..... L 4
Amakusa Sea ..... J 4
Ariake Bay ..... K 5
Asahi-Dake (Peak) E11

Prepared expressly for THE WORLD BOOK ENCYCLOPEDIA

JAPAN AND KOREA

Asama-Yama (Peak) . . m17
Ashibetsu-Dake (Peak) E11
Ashizuri, Cape . . . . . J 6
Atsukeshi Bay E12
Atsumi Bay o16
Awa (Isl.) . . . . . G 9
Awaji (Isl.) . . . . . I 7
Biwa (Lake) n15
Bukkyo-Dake (Peak) . . . I 7
Bungo Strait . . . . . J 6
Chejū (Saishu) Isl . . . . J 3
Chiri-San (Peak), Korea . . . . . I 3
Chokai-San (Peak) G10
Daiō, Cape . . . . . I 8
Danjo (Isl.) . . . . . J 4
Ena-San (Peak) n16
Erimo, Cape F11
Esan, Cape F10
Fuji, Mt n17
Ganju-San (Peak) G10
Gotō Is . . . . . J 4
Hajiki, Cape . . . . . G 9
Haku-San (Peak) m15
Hayachine-San (Peak) . G10
Hekura (Isl.) . . . . . H 8
Higashi (Dōgo) (Isl) . . . H 6
Hirado (Isl.) . . . . . J 4
Hokkaidō (Isl.) . . . . . E 9
Honshu (Isl.) . . . . . I 6
Ide-San (Peak) . . . . . H 9
Iki (Isl.) . . . . . J 4
Inawashiro (Lake) H10
Inubo, Cape I10
Irō, Cape . . . . . I 9
Ise Bay o15
Japan, Sea of . . . . . F 6
Kagoshima Bay . . . . . K 4
Kami (Isl.) . . . . . I 4
Kamori-Yama (Peak) . . . I 6
Kamuri-Yama (Peak) . . n15
Kangha Bay, Korea . . . . H 2
Kariba-Yama (Peak) . . . E 9
Kasatori-Yama (Peak) J 6
Kasumiga-Ura (Bay) . . . H10
Kii Strait . . . . . J 7
Kincoku (Peak) . . . . . G 9
Kiso-Sammyaku (Mts.) . n16
Korea Bay, Korea . . . . . G 2
Korea Strait, Korea . . . . J 3
Koshiki (Isl.) . . . . . K 4
Kōzu (Isl.) . . . . . I 9
Kuchino (Isl.) . . . . . L 4
Kuchino Erabu (Isl.) . . . K 5
Kuju-San (Peak) . . . . . J 5
Kunimi-Dake (Peak) . . . J 5
Kuro (Isl.) . . . . . K 4
Kusakaki (Isl.) . . . . . K 4
Kyōga, Cape . . . . . I 7
Kyuroku (Isl.) . . . . . F 9
Kyushū (Isl.) . . . . . J 5
Mi (Isl.) . . . . . I 5
Mikura (Isl.) . . . . . J 9
Miyake (Isl.) . . . . . I 9
Muroto, Cape . . . . . J 7
Mutsu Bay F10
Nakadōri (Isl.) . . . . . J 4
Nakano (Isl.) . . . . . L 4
Nanatsu (Isl.) . . . . . H 8
Nasu-Dake (Peak) . . . . . H 9
Nemuro Strait E12
Nii (Isl.) . . . . . I 9
Nojima, Cape . . . . . I 9
Noma, Cape . . . . . K 5
Norikura-Dake (Peak) m16
Noto (Isl.) . . . . . H 8
Noto Peninsula . . . . . H 8
Oeyōn (Isl.), Korea . . . . H 2
Oga Peninsula . . . . . G 9
Oki Is . . . . . H 6
Okushiri (Isl.) . . . . . E 9
Omae, Cape o17
Ontake-San (Peak) n16
Osaka Bay o14
O Shima (Isl.) . . . . . I 9
Osumi Is . . . . . K 5
Osumi (Van Diemen) . . . . . Strait . . . . . K 5
Otaru Bay E10
Poroshiris-Dake (Peak) E11
Rausu-Dake (Peak) D12
Rebun (Isl.) D10
Rishiri (Isl.) D10
Rurui, Cape D13
Sado (Isl.) . . . . . G 9
Sagami Sea n18
Saishū (Isl.), Korea . . . . J 3
Sendai Bay G10
Shakotan, Cape E10
Shikoku (Isl.) . . . . . J 6
Shimo (Isl.) . . . . . J 5
Shiono, Cape . . . . . J 7
Shioya, Cape H10
Shiretoko, Cape D12
Shiriya, Cape F10
Sollyu-Bong (Mts.), Korea . . . . . G 2
Sorak-San (Peak), Korea . . . . . G 4
Sōya, Cape D10
Sōya Strait D10
Sungari Reservoir . . . . . E 3
Suo Sea . . . . . J 5
Suruga Bay o17
Suwanose (Isl.) . . . . . L 4
Suzu, Cape . . . . . H 8
Suzuka-Sammyaku (Mts.) o14
Take (Isl.) . . . . . H 5
Tanega (Isl.) . . . . . K 5
Tanega Strait . . . . . K 5
Teure (Isl.) D10
To (Isl.) . . . . . I 9
Tobi (Isl.) . . . . . G 9
Todoga, Cape G11
Toi, Cape . . . . . K 5
Tokara Strait . . . . . K 5
Tokara (Is.) . . . . . L 4
Tōkyō Bay n18
Tongjoson Bay, Korea . . . . . G 3
Tori (Isl.) . . . . . J 4
Totōmi Sea o16
Towada (Lake) F10
Toyama Bay . . . . . H 8
Tsushima Is . . . . . I 4
Tsushima Strait . . . . . J 4
Tsugaru Strait F10
Tsurugi San (Peak) . . . . J 7
Uchiura Bay E10
Uji (Isl.) . . . . . K 4
Ullūng (Utsuryō-Tō) (Isl.), Korea . . . . . H 5
Wakasa Bay . . . . . I 7
Yaku (Isl.) . . . . . K 5
Yangeshiri Teure (Isl.) D10
Yariga-Take (Peak) . . . H 8
Yatsuga-Take (Peak) . . . I 9
Yatsushiro Sea . . . . . K 4
Yokoate (Isl.) . . . . . L 4
Yongil Bay, Korea . . . . . H 4

take tours to see flowers and trees. The Japanese greatly admire courage, and during World War II, Japanese soldiers became famous for their personal bravery. Part of this bravery comes from the code of honor which all Japanese are taught. They believe that death is to be preferred to disgrace. Japanese often commit suicide when they feel they have disgraced themselves and their families.

Shelter. In the large cities, there are steel and cement government buildings, office buildings, and stores. But the common people still live in the traditional Japanese one-story wooden houses.

These houses are usually small, with one or two rooms. Doors and windows are sliding paper screens. The rooms have straw or bamboo mats instead of wood on the floors. Japanese take off their shoes when entering houses so as not to damage the mats. A low table is usually the only furniture. People sit on cushions on the floor. Beds are heavy quilts which are spread out on the floor at night and stored in cupboards during the day. The only heat is from a few sticks of charcoal in a large earthenware pot, called a *hibachi*. Cooking is done over charcoal, but in the large cities some homes have gas stoves. In large homes, the main living rooms overlook the garden in the back. Most rooms have a nook in one wall where a family scroll hangs, or where a bowl of flowers is kept.

Food. Japanese meals are very simple. Rice is the most important part of a meal, and most Japanese eat three or four bowls of it at a sitting. Besides rice, the Japanese eat much fresh and salted fish. They often eat fish raw. Most green vegetables are eaten pickled. Sweet potatoes are an important part of the diet, as well as soybean curd and seaweed. Very little meat is eaten, since it is scarce and expensive. The Japanese are more interested in how their food looks than in how it tastes. Meals are served on lacquered trays in many pretty, tiny bowls. Food is arranged with an eye to color. To many Westerners, Japanese food seems tasteless. Japanese eat their meals with chopsticks, but in the cities many know how to eat with a knife and fork.

Clothing. The traditional Japanese clothing is the *kimono*. This is a long, loose robe of cotton or silk, tied about the waist with a sash, called an *obi*. Girls and young women usually wear kimonos of bright colors covered with flower designs and traditional prints. Older women wear gray, brown, and black kimonos. Boys in summer sometimes wear light, checkered kimonos, but most Japanese boys wear Western-style clothing.

School children often wear a sort of uniform. The girls wear blue skirts and middy blouses, and the boys wear dark blue suits. Farmers and poor workers in the city often wear tight pants and short jackets. In the city, the men usually wear Western-style suits at work and on the street, but they generally change into brown and black kimonos when they relax at home.

During the 1920's, many Japanese women started to wear Western-style dresses, but the style did not become very popular. During World War II, a new style of dress, called *mompei*, became a national garb of Japanese women. The *mompei* is a one-piece garment with long legs which are fastened tight around the ankle. It is somewhat like an American coverall. Japanese women seldom wear hats. Almost all men wear Western-style hats or caps.

Most Japanese men in cities wear leather shoes. The poorest men and many children wear *geta*, which are wooden sandals built on a pair of two- or three-inch high blocks. Japanese women wear *geta* or *zori*, which are flat sandals made of wood or woven straw. In their houses, they often wear short white socks with felt soles.

Their Work. The common Japanese people work hard, whether they are farmers or city factory and shop-workers. In 1940, about 43 per cent of all workers were farmers. The rest were engaged in other occupations in villages, towns, and cities. In Japan, everyone works. On the farms, men, women, and children just old enough to walk work in the rice fields. In the cities, the entire family helps earn the family's living. Many people work in factories, but many manufactured products are also made in small home industries. Even school children must work after school hours.

Agriculture. The growing of crops is still the most important occupation in Japan. During the early 1900's, as Japan became industrialized, many people went to the cities. After the end of World War II and the coming of Allied restrictions on Japanese industry, many Japanese returned to the farms.

Farm land is scarce in Japan, and farms are small. The average farm is only about two and a half acres. Before World War II, most of the farms were owned by landlords to whom the farmers paid rent. Many times farmers did not make enough money to live, and they had to keep borrowing money from the landlords. Most Japanese farmers were always in debt. Often they tried to get out of debt by hiring out their children to work in

Fritz Henle

The Owner of a Japanese Teashop figuring customer's bills with the aid of an abacus. This device of beads sliding on spindles was invented in China. It is very helpful to the Japanese, who are unable to do arithmetic by the methods used in Western countries. This is because of their clumsy system of writing numbers. But with the abacus they can add, subtract, multiply, and divide quickly and accurately.

factories and shops. Daughters were often sold to owners of places of entertainment in the cities. The landlords often made these arrangements.

When the Allies occupied Japan after World War II, one of the first actions taken was to improve the conditions of farmers. The large estates of landlords were ordered broken up to be sold to the people who farmed the land. Farmers' debts to landlords were cancelled. Farmers were forbidden to hire out their children as practically slaves.

The main crop in Japan is rice. Japan grows about four fifths of the rice it needs. Rice is grown in paddy fields — fields with dirt walls around them and flooded with water. Fields are terraced steps of different levels to allow water from near-by streams to flow down from field to field. Except in the most southern part of Japan, only one crop is grown each year. More than half of all Japanese acreage is used to grow rice. Other main crops are wheat, barley, and soybeans. Farmers also grow potatoes and radishes for food. Only one half of 1 per cent of all acreage is used for growing tea, but this is enough for Japan's needs and for a large export trade in tea. Tea grows well on the hillsides of southern Japan.

To get money, many Japanese farmers also grow silk. With a few mulberry trees, they are able to raise silkworms at home. When the silk cocoons have matured, the farmers sell them to dealers in the towns, who send them to silk mills.

There is little livestock in Japan. Land is too scarce to be used for grazing, and other food for animals is too expensive. In central and southern Japan, a few chickens are the only animals seen on farms. Large herds of cattle may be found in the fields on Hokkaido, where there is room for grazing. Most of Japan's beef, milk, and butter comes from Hokkaido.

Ewing Galloway

A Japanese Mother Carrying Her Baby in a sling upon her back. The use of the sling leaves the mother's hands free for other activities. In Japan it is common to see mothers busily working with their babies on their backs. One reason for this practice is the lack of day nurseries for infants.

The Japanese farmer must work very hard for at least nine months of the year. In the spring, he grows a garden and plants his rice crop. His fields must be constantly fertilized, because the soil is poor and worn-out. The rice must be transplanted after it has reached a certain size, and this is done by hand. Fields are so small that machinery is of little use. Most farmers could not afford to buy machinery even if their farms were big enough to make its use practical. A second garden is planted during the summer. In the fall, the rice is harvested. During these times, the farmer also tends his silkworms.

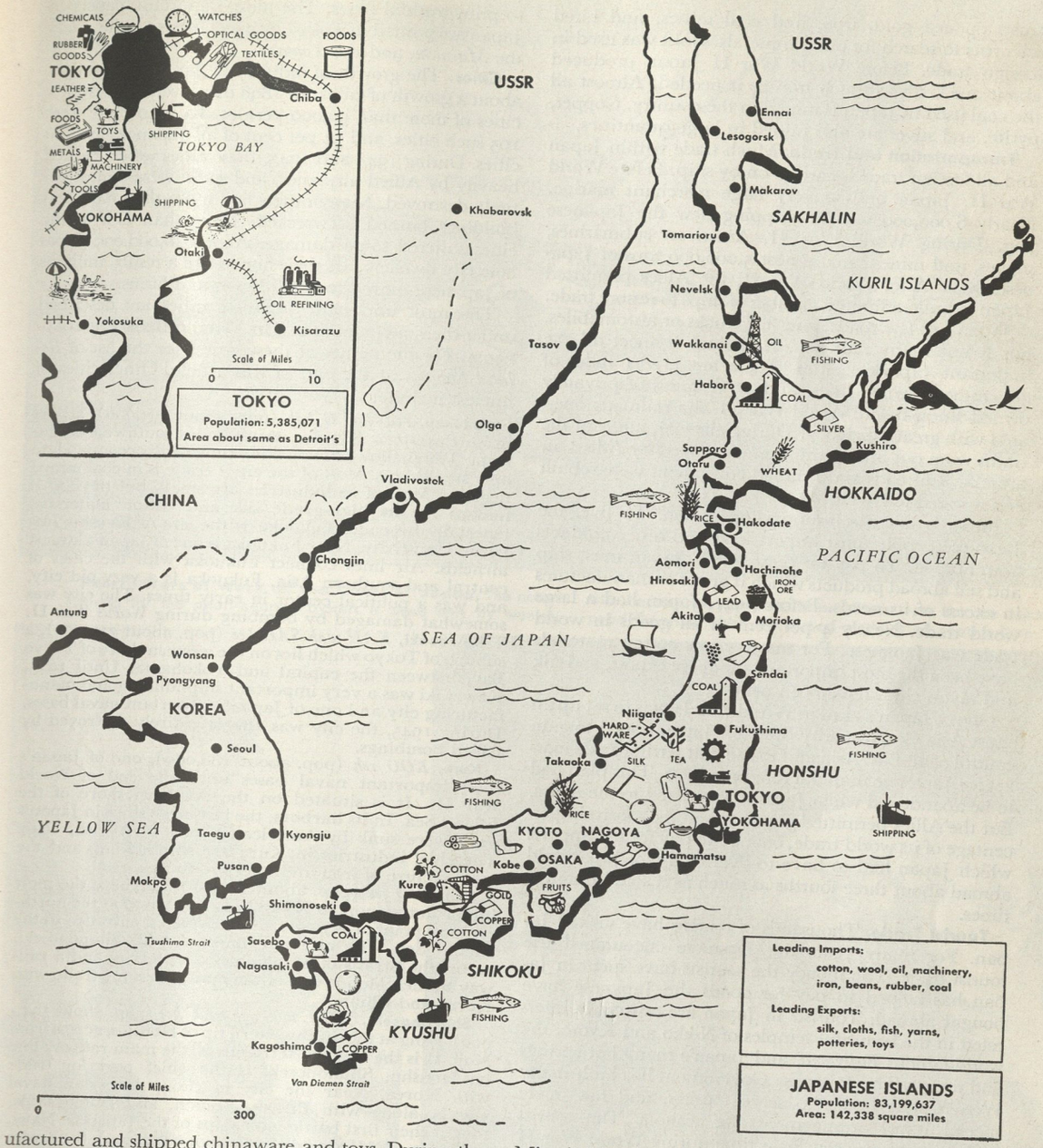
The average income of a farmer is only about $175 a year. If he owns his land, he must pay heavy taxes out of his meager yearly income. The government has tried to aid agriculture with various laws controlling prices and providing for loans to landowners. At times many farmers have objected to the low government price for rice, and have refused to sell their crops to government buyers. Instead, they have sold crops through the black market for higher prices.

Fisheries. Fishing is second only to agriculture as Japan's most important food industry. About 1,500,000 people make a living by fishing. Fish is the only meat most Japanese eat. Before World War II Japanese fishing boats sailed to almost all parts of the Pacific. Japanese fishermen caught salmon off Alaska, and hunted for whales in the Arctic and Antarctic oceans. The Japanese had permission to fish in Soviet waters off Siberia, and Japanese fishing boats also worked out of the Central Pacific islands. After World War II, the Japanese were limited to their home waters, and forbidden to fish near Allied-held countries and islands. Before World War II, the Japanese caught more fish than they could eat. They exported the excess to other countries. The largest exports were of crab meat, lobster, and salmon. But the restrictions on fishing after World War II cut down the Japanese shipments of fish.

Manufactures. Before Commodore Matthew C. Perry opened Japan to the world in 1854, Japan was a country of agriculture and small home industries. Afterward, Japan's rulers tried to turn the country into a modern industrial nation. There were two reasons for this. First, the Japanese wanted to manufacture the things that were necessary to make them strong among the world powers. Second, Japan's population increased so greatly that it was necessary to sell and ship much goods out of the country in order to bring enough money into Japan to support its population.

Both heavy and light industry expanded rapidly. Large steel plants were built. At first most machinery was bought abroad, but after World War I, Japan made most of its own machinery. The chemical industry has also grown along with the allied manufactures of medicines, sulfuric acid, dyestuffs, paints, soap, celluloid, rayon, and paper. Large shipbuilding yards were set up, and Japan built most of its own ships.

For export trade, Japan developed the textile industry. At one time Japan sold most of the cotton goods used in China, India, and the East Indies. Large amounts of silk cloth were also sold. The Japanese man-



ufactured and shipped chinaware and toys. During the 1930's, Japan's industry prepared for war. The manufacture of peacetime goods dropped, and the making of war materials increased. A large airplane and military automobile industry developed.

Nearly all Japan's industry was once controlled by eight families. These family groups, called the *Zaibatsu*, ran the mines, factories, and trading firms. The Imperial family owned large shares in these companies. The most important business families included the Mitsui, Mitsubishi, and Sumitomo. These families also controlled banks, newspapers, and political parties. They competed with the army in running Japan. After World War II, the Allies took steps to break up these family trusts and to spread the control of industry and trade among a larger group of Japanese. The Allies also limited Japan's industries to the manufacture of peacetime goods.

Minerals. As Japan became industrialized, the country's mineral resources were developed. The family

trusts opened gold, iron, and coal mines, and hired scientists to search for other minerals. Gold was used in foreign trade. Before World War II Japan produced about one sixth as much iron as it needed. Almost all the coal used in Japan is mined in the country. Copper, pyrite, and silver are also mined in large quantities.

Transportation and Trade. Much trade within Japan and all foreign trade is carried on by ship. Before World War II, Japan built a very large merchant marine. Nearly 6,000,000 tons of shipping flew the Japanese flag. During World War II, American submarines, planes, and mines sank almost 5,000,000 tons of Japanese ships. After World War II, the Allies permitted Japan to build a limited number of ships to restore trade.

Japan has few roads, and few trucks or automobiles, but it has many railroads. Rail lines connect all the important Japanese cities. There are 11,271 miles of government-owned lines, and 4,131 miles of privately owned lines. Before World War II, the railroads operated with great efficiency. During the war, many of the trains wore out and many were destroyed by Allied air attacks. Railroads and railroad equipment were rebuilt and restored following World War II.

Japan is not a self-supporting nation. To live, the Japanese people must import food and other products from abroad. To pay for these goods, Japan must ship and sell abroad products which it grows or manufactures in excess of its needs. Before 1941, Japan had a large world trade. Nearly 4 per cent of all goods in world trade was Japanese. For many years, cotton materials have been the most important Japanese export, and silk and rayon cloth have been next.

One of Japan's aims in World War II was to set up an "East Asia Co-Prosperity Sphere." Japan hoped to gain control of all East Asia and to use that territory as a market for Japanese manufactured products. This plan had to be abandoned when Japan surrendered to the Allies. But the Allies permitted Japan to resume a certain percentage of its world trade, enough to pay for the imports which Japan had to have to live. By 1950, Japan sold abroad about three fourths as much as it sold in prewar times.

Tourist Trade. Thousands of tourists have visited Japan. For many years the Japanese encouraged the tourist trade. The money the tourists have spent in Japan has helped to pay for goods the Japanese have bought abroad. Tourists in Japan are especially interested in the beautiful temples of Nikko and Kyoto, the world-famous *Fujiyama*, and Japan's many hot springs and resorts. The Japanese Government has built many Western-style hotels to serve tourists, and has made special travel arrangements for visitors. The tourist trade was interrupted for a time during World War II and in the years immediately following.

Communication. Japan has a modern communication system. All the towns and cities have telephones, and there is an extensive telegraph and radio system. Japanese radio broadcasting stations are government-owned. The Japanese postal service is very efficient.

Many newspapers are published in the large Japanese cities. These papers were once controlled by the Government, but, after World War II, an Allied directive ordered that the press be free. The press then began to print truthful news. The most important papers in Japan are printed in Tokyo. Some of them are the *Asahi*, the *Mainichi*, and the *Yomiuri*.

Cities. The growth of industry in Japan has brought about a growth of cities. In 1898 there were only twenty cities of more than 50,000 persons. In 1940 there were 105 such cities, and 54 per cent of all Japanese lived in cities. During 1944 and 1945, these cities were attacked heavily by Allied airplanes, and some were almost entirely destroyed. Many others had more than half their buildings burned or wrecked. More than half of the cities suffered some damage. About 10,000,000 Japanese city dwellers lost their homes. As a result, millions of Japanese moved to small towns and farms.

The most important Japanese cities are described under their own names in THE WORLD BOOK ENCYCLOPEDIA. For the names of these cities, see the list of *Related Subjects* at the end of this article. Other cities of interest include:

Fukuoka, *FOO koo O kah* (pop. about 393,000), a port in northwestern Kyushu, thirty miles southwest of Yawata. The shallow harbor at Fukuoka will accommodate only small ships. Most of the city's trade is in coal mined near by. Most of its industries are small, but the city is famous for its high-grade silk and cotton materials, especially brocade. Fukuoka is the site of Kyushu Imperial University. Near Fukuoka is one of Japan's largest airfields. Air lines connect Fukuoka with the cities of central and southern Asia. Fukuoka is a very old city, and was a political center in early times. The city was somewhat damaged by bombing during World War II.

Kawasaki, *KAH wah SAH kee* (pop. about 319,000), a suburb of Tokyo which lies on the western shore of Tokyo Bay, between the capital and Yokohama. Until 1945, Kawasaki was a very important shipbuilding and manufacturing city and one of Japan's important naval bases. During 1945, the city was almost entirely destroyed by Allied bombings.

Kure, *KOO reh* (pop. about 188,000), one of Japan's most important naval bases until the end of World War II. It is situated on the northern shore of the Inland Sea. In its harbors, the last large ships in Japan's navy were sunk by American planes in August, 1945. The chief industries in Kure are shipbuilding and the manufacture of iron and steel products.

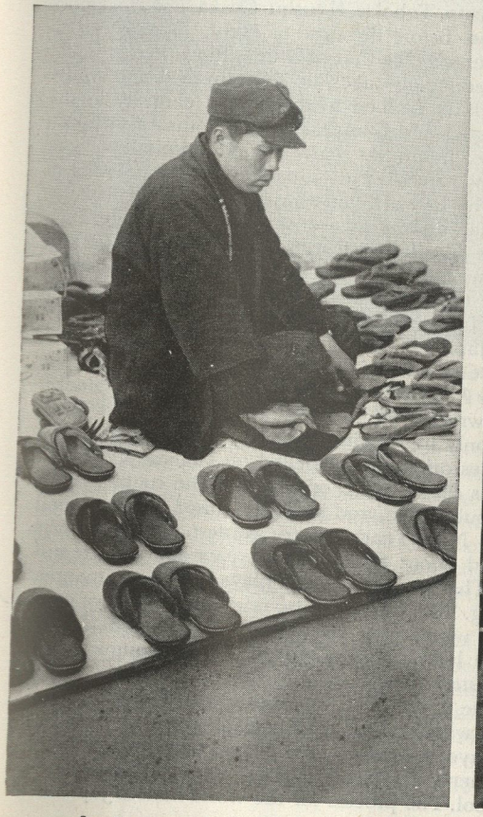
Moji, *MO jee* (pop. about 124,000), perhaps the most important seaport in Kyushu. It is situated at the northernmost point of Kyushu, at the western entrance to the Inland Sea. The city is connected with Shimonoseki, across the Straits of Shimonoseki, by ferries and a railway tunnel. Moji is one of the main ports for trade with Korea and China.

Shimonoseki, *SHEE moh noh SAY kee* (pop. about 194,000), lying at the southwestern tip of Honshu, across from Moji. It is the western terminus of the main railway line on Honshu. Shimonoseki is the chief port for trade with Korea. Near the city in 1864, American naval vessels, along with British, French, and Dutch ships, fought their first battle with ships of the Japanese Navy.

Yawata, *YAH wah tah* (pop. about 210,000), the center of Japan's heavy manufacturing, is located on the hilly seacoast of northern Kyushu, near Moji. Large quantities of coal are mined near by. Iron from neighboring mines is refined and steel is manufactured in government-owned mills located in Yawata. The city lies in the center of an industrial area of more than 1,000,000 persons. Cement and chemical works have been built in the area, as well as glass factories, sugar refineries, flour and paper mills, oil refineries, and machine shops. Yawata was the target of the first B-29 air raid on Japan on June 15, 1944.

WORKING PEOPLE OF JAPAN

Pearl Divers at Work off the Coast of Japan. The actual diving for the pearl-bearing oysters is done only by women, who become very expert. These divers work for the Mikimoto pearl fisheries, which developed methods of pearl culture.



An Open-Air Shoe Store. The shoes with toes are for men. The others are women's.

An Assembly Line in an Automobile Factory in Tokyo. The success of Japan's industries depends largely on the cleverness and dexterity of its workers.

Photos: Burton Holmes, Ewing Galloway; Gendreau; Black Star

Nippon Studio, Black Star

A Japanese Artist Painting a Scroll. The paint is put either directly on silk or on paper. Japanese painters become expert in handling their brushes, and various schools of painting are distinguished by the kinds of brushstrokes.

Social and Cultural Achievements

Social Conditions. Japan has always had a system of strictly defined social classes. These classes were more rigid some years ago than they are today, but social castes are still much more sharply divided than in western countries.

At the top of the social structure is the Imperial family, with the Emperor and his family and a group of Imperial princes, whose children are eligible to marry members of the Imperial family. Next comes the peerage. The ranks in the peerage include those of prince (not Imperial princes), viscount, marquis, baron, and count. In feudal times, the next lowest class was the *samurai*. The *samurai* were members of the warrior class. They led the professional armies of the lords who ruled Japan. After 1871, the *samurai* were abolished as a class. Most of them became tradesmen, but some were able to enter the nobility.

The rest of the Japanese belong to the common classes. In feudal times, there was little distinction among the people of the common classes. Today upper, middle, and lower classes within the mass of the common Japanese people are divided about as they are in other countries. It is much more difficult for a member of one class to work up to a higher class than it is in western countries. Occasionally a very wealthy man may be made a member of the nobility.

The possibility of stepping up from wealth to nobility is slim, but it is much more likely than the possibility that a poor boy may become a rich man. One of the reasons why this is true is that the control of Japan's wealth has always been in the hands of a small group. A second reason is that university education generally has been limited to the well-to-do. The only higher education for poor boys was in the army schools. A third reason has been the family system. A son is expected to engage in the same trade as his father. Children have not been encouraged to try to seek their fortunes in trades or professions that appear to be above the social level of their families.

Education. Grade school education was made compulsory in 1872. All children are required to attend school for at least six years. This education is free. After elementary school, children may attend "middle school," for four to six years. These schools charge fees and teach different types of courses. After middle school, students may go on to college or a university, but the fees for these schools are very high.

Boys and girls attend the same grade schools. During middle school, boys and girls go to separate schools. Since about 1910 women have been permitted to attend universities, but some colleges still do not give women degrees. About 99 per cent of all Japanese children attend grade school, but a much smaller number go on to higher schools because it costs so much, and because many children have to leave school to go to work.

The elementary school student spends most of his time learning to read and write. This is much more difficult for the Japanese than for the American student, because the Japanese language is much more complicated than the English language. Most of the Japanese can read and write. But the Japanese cannot be said to be a well-educated people, because so few students go any farther than grade school.

Many of Japan's higher schools were started by foreign funds and had foreign teachers at first. Doshisha University in Kyoto was built by Americans, and St. Paul's University in Tokyo was built by Englishmen. The largest universities are government-owned and are called Imperial Universities. There are six of these — Tokyo, Kyoto, Tohoku, Kyushu, Osaka, and Hokkaido.

Medicine. Before the time of Perry, Japanese medicine was largely like that of China. Since Perry, Japan has enthusiastically taken up Western medicine. Many Japanese have studied medicine and dentistry in the United States and Europe and have returned to Japan to practice. Japan has many modern hospitals.

Arts and Crafts. The Japanese are great lovers of beauty. This love of beauty has expressed itself in poetry and drama, in painting and sculpture, and in the making of fine porcelain. Most of Japan's early art was patterned after Chinese art. Later Japanese art was somewhat like that of Western countries, but it has always reflected Japanese thought and feeling.

Early Japanese writings had Chinese models. The *Nihongi*, or *Chronicles of Japan* (A.D. 720), was in Chinese style. *The Kojikiden*, or *Exposition of the Record of Ancient Things*, written by Motoori a thousand years later, showed only minor changes in the old style. Japanese poetry was originally modelled on Chinese styles, but lately has shown some originality. The couplet is the most popular form, and is the style used for the annual Imperial New Year's poetry contest. The *No* plays developed about five hundred years ago and are still played. They are like Chinese plays in form and manner of staging. The Japanese also originated a type of puppet play where very large puppets were used. Today Japanese books, magazines, and plays borrow much from Western models.

Chinese artists first introduced painting to Japan. Painting was done in the Chinese style until about 1775 when Okyo, a peasant's son, began painting things "as he saw them." Okyo started the present popular naturalistic school. The process for the world-famous Japanese prints also came from China. Kiyonobu (1664-1729) made this form of wood engraving popular with his colored pictures of famous actors and theater scenes. He used three blocks of pale green, blue, and pink. Later, as many as thirty blocks might be used to complete a "brocade picture." Some of the best Japanese art appears in ivory and wood carvings, lacquer ware, bronze casting, and metalwork.

Traditional Japanese music is much like Chinese music and sounds tuneless to western ears. The usual instruments are gongs, drums, and a sort of banjo, called a *samisen*. Today many Japanese enjoy the classical and popular music that is played in the United States and Canada. Tokyo has an excellent symphony orchestra.

Recreation. Japan is a beautiful country and the Japanese like to take excursions to see it. More than one third of all forests are government-owned and these are free for tourists to visit. Many Japanese make visits to the great shrines at Nara, Nikko, and Kamakura. They also like to climb the sacred Mt. Fuji. Hot springs resorts, such as Atami and Hakone, are popular.

The most popular recreations for the poor who cannot afford trips are the theater and the public baths. The Japanese like to bathe once a day and the poor take their baths at public bathhouses, which are almost like neighborhood clubhouses. Japanese enjoy both western and Japanese sports. Soccer, rugby, and baseball have been popular for many years. *Judo*, a form of self-defense, is taught to all schoolboys. *Sumo*, a type of wrestling, is as popular in Japan as boxing is in the United States.

Eating Sukiyaki with Chopsticks in a Tearoom. Sukiyaki is made of beef and various vegetables, cooked at the table. It is usually served with rice.

High School Girls of Japan. The sleeves of their kimonos can be used to carry parcels.

A Japanese Hostess and Her Visitor greet each other with great politeness. Note the sliding doors of the room, and the absence of furniture.

Photos: Ewing Galloway; Acme; Nippon Studio, Black Star

Dancers of the Takaradzuka Theater in Tokyo performing a spring dance. The theater specializes in reviews, and has all girl performers. The fans of these dancers bear the Rising Sun emblem of Japan.

Religion. For hundreds of years the most important religion in Japan had been Shinto — the Way of the Gods. But four other religions have influenced Japanese life and thought — Buddhism, Confucianism, Taoism, and Christianity. See BUDDHIST; CHRISTIANITY; CONFUCIUS; SHINTO; TAOIST.

Shinto is the original Japanese religion. It began in early times with the worship of the spirits of nature. Animals, trees, rivers, and waterfalls were believed to contain the spirits of gods, and shrines were set up in their honor. Shintoism eventually grew to include worship of ancestors. Out of this grew the modern Shintoism, which has been the basis of the Japanese social structure.

After 1868, the Government gave special encouragement to Shintoism, because it emphasized loyalty to the emperor, who was believed to be divine. Belief in the teachings of Shinto made it much easier to turn Japan into a nation of people willing to fight and die for their emperor. The Government built and supported many new Shinto shrines in honor of Shinto heroes and Imperial ancestors. Pilgrimages to these shrines were encouraged. Shinto worship was compulsory in all schools. The thirteen Great Festivals and eight Small Festivals of the Shinto year were made national holidays. In the name of the Japanese people, the Emperor worshipped his ancestors in the sanctuary of the Imperial Palace. On all great state occasions, the Emperor travelled to the Grand Shrine of the Sun Goddess at Ise to worship. Statesmen also went to Ise to report to the Sun Goddess momentous happenings in Japan's affairs.

At the end of World War II, the Allies ordered the Japanese to abolish Shinto as a state religion and to cease support of the religion. The Emperor and state officials were forbidden to make state occasions of Shinto holidays, and schools were ordered to stop teaching Shinto as a state religion. On January 1, 1946, Emperor Hirohito issued an Imperial rescript in which he denied that he was divine or that the Japanese people were of divine origin. This rescript removed much of the basis for belief in the Shinto religion.

The second most important religion in Japan is Buddhism. Many Japanese practice both Buddhism and Shintoism. They do this in the belief that Buddhism is a religion, but Shintoism is a sort of patriotism. Buddhism came to Japan from Korea and China as early as A.D. 552. In 604, Prince Shotoku helped the religion to spread by publishing a code of behavior based on Buddhism. Several sects of the religion sprang up. Among these are *Zen*, *Jodo*, *Shin*, and *Nichiren*. Today there are more than 100,000 Buddhist temples and shrines in Japan. There is a famous giant statue of Buddha, called the *Daibutsu*, at Kamaukra. Most Japanese homes have both Shinto and Buddhist altars in them.

Confucianism and Taoism were brought also to Japan from China, but neither became very strong as a religion. Iyeyasu, who was *shogun* or ruling feudal lord of Japan from 1603 to 1616, had the works of Confucius printed, and they became very popular. Confucius taught obedience and loyalty to authority, which influenced and fitted in with Japanese Shintoism.

Portuguese missionaries first brought Christianity to Japan in the 1500's. The religion became popular in southern Japan at that time. But when the Government ordered all foreigners to leave Japan and all foreign influences wiped out near the end of the 1500's, Christianity was also forbidden. Thousands of Christians were killed. But some Christians, especially in the vicinity of Nagasaki, continued to practice their religion. The restoration of religious freedom in the 1870's revealed the fact that several thousand Japanese still clung to the Christian beliefs. Foreign missionaries were allowed to come to Japan to spread the religion. Today, there are more than 2,000 Christian churches in Japan, and over 350,000 Christians. In May, 1941, the Japanese Government established relations with the Roman Catholic Church.

Government

Japan was made a constitutional monarchy in 1889, under the terms of a constitution proclaimed by Emperor Meiji. The constitution could be amended by the Diet, or Legislature, acting on an Imperial Order, but until the end of World War II, it was never changed. In 1946, under the direction of the Allies, the Japanese prepared a new constitution, completely democratic, which went into effect on May 3, 1947.

According to the old constitution, the Emperor was the head of the state. He was said to be divine and to be the state itself. Until 1945, Japanese school children were taught that Emperor Hirohito was the 124th direct descendant of the first Japanese Emperor Jimmu Tenno, who was supposed to have become emperor in 660 B.C. The Japanese are no longer taught that the Emperor is divine. Some Japanese scholars doubt that the present imperial family line has remained unbroken. There is even some doubt that the present imperial family is the authentic imperial family.

Under the new constitution, the Emperor remains the symbol of the state and of the unity of the people, much like the king of England. But the Emperor now has no real authority. Political power is in the hands of a Prime Minister, who must be elected by the Japanese parliament, called the Diet, before he can be appointed by the Emperor. The Prime Minister appoints a Cabinet, whose members run various departments of the government. If the Prime Minister and his Cabinet lose the confidence of the Diet, the Cabinet resigns and a new Prime Minister and Cabinet are appointed, or the Prime Minister may call for a general election. All men and women over twenty-five years of age are permitted to vote.

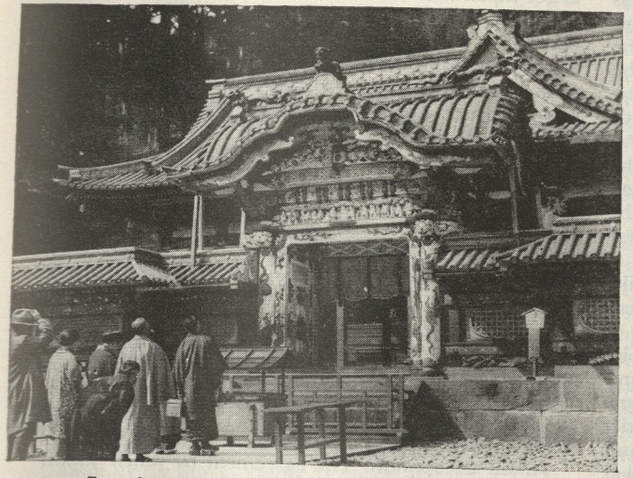
The new Japanese Diet is composed of two houses. The House of Representatives is made up of members elected for four-year terms. The House of Councillors has members elected for six-year terms, with half the membership seats up for election every three years.

The House of Councillors takes the place of the old House of Peers. Under the old system, the House of Peers was made up of members of the Imperial family, and various members of the peerage, such as princes, marquises, counts, viscounts, and barons. The House of Peers also had thirty-six members who were elected by the largest taxpayers in Japan.

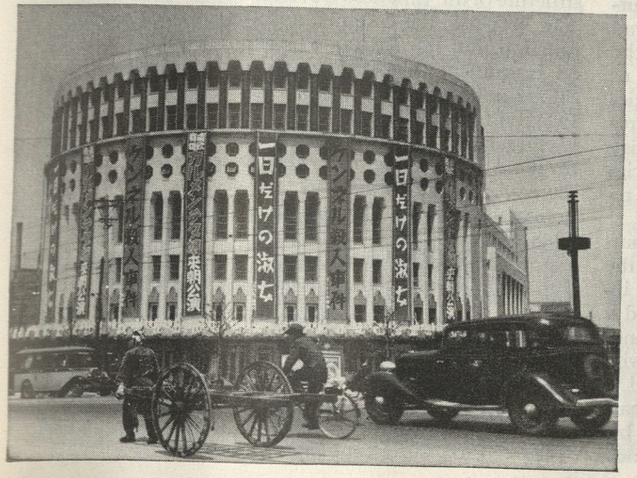
An independent system of courts, headed by the Supreme Court of Japan, was established under the new constitution. Under the old court system, all Japanese judges were appointed by and under the control of the Minister of Justice, who was appointed by the Emperor.

OLD AND NEW ARCHITECTURE IN JAPAN

The Parliament of Japan meets in the Imperial Diet Building in Tokyo. This large, handsome structure on a hilltop is in Western rather than Japanese style. Most of the surrounding part of Tokyo was damaged in World War II.



Temple and Tomb of Iyeyasu, a ruler of feudal times. It is in Nikko, a town noted for its many beautiful shrines.



The Nippon Theater in Downtown Tokyo. This modernistic structure is the largest motion-picture theater in Japan.

Photos: Gendreau; Ewing Galloway

Osaka Castle Was Built Centuries Ago as a warlord's fortress and home. It still stands in a park in the city of Osaka.

The new constitution also provides for democratic local government for the Japanese. Japan is divided into forty-six prefectures, or *ken*, as the Japanese call them. The governors of the prefectures and the mayors of the cities and villages used to be appointed and controlled by the Minister of Home Affairs. But now these local officials are elected by the people of each community.

A bill of rights in the new Japanese constitution guarantees freedom of speech, of the press, of religion, and of thought. The document also provides equality of opportunity for the sexes, and thus frees many Japanese women from the partial slavery in which they had been held. The constitution prohibits most kinds of child labor, and protects the rights of workers to organize trade unions and to bargain collectively with their employers.

With the new constitution, the Japanese became the first people of the world to renounce war as a sovereign right of the nation, and the threat of war or the use of war as a means of settling international disputes. This pledge for peace is embodied in one of the articles of the new constitution. Until after World War II, the Japanese military leaders had authority to act in the name of the Emperor without the approval of either the Cabinet or the Diet. Under such a system, the generals and admirals could conduct things as they saw fit. All the military leaders needed was the support of the people and a weak Emperor. In the 1930's, when Japan began its ill-fated attempt at conquest of the Pacific world, the military leaders had both of these requirements for control of Japan.

Political Parties. In the past, political parties like those in the United States and Great Britain had had very little success in Japan. They did not succeed because of the general lack of education of the common people, their lack of experience in democratic government, and the strong control of politics by a small group of leaders. During the early 1900's several political parties developed. Most important of these were the *Minseito* and the *Seiyukai*. But these parties were largely controlled by family trusts such as the Mitsuis and Mitsubishis, and never had any real policies.

Communism and socialism made some progress during the 1920's. But the Japanese Government declared the Communist and Socialist parties illegal. In the 1930's Communists and Socialists were put in jail or forced to leave the country. In 1940 all political parties were abolished. The only remains of a political party was an organization called the "Imperial Rule Assistance Association." This organization upheld the policies of imperialism and state control. Political parties reappeared in Japan after the end of World War II.

The real political influences in Japan have been outside the regular political parties. Until about 1931, the most important political group was made up of the industrialists, or the family trusts. This group wanted a strong Japan and wanted to increase Japanese influence and trade abroad. But this group did not want war with the Western Powers. The industrialists also wanted to keep the masses of Japanese people obedient and easy to govern. The group pretended to favor democracy, but it actually prevented the growth of real democracy. Most of all, the industrialists of Japan wanted cheap labor.

Members of fanatic secret societies fought this group. Strongest of these societies was the Black Dragon Society. These groups believed that Japan was divine and had a mission to rule the world. They worked to make Japan militarily strong enough to rule the world. Any liberal politicians who worked against the aims of the societies were discredited or assassinated. Members of these secret societies and Japanese who agreed with their aims got control of the army. As the army became stronger, it took more and more control of the government, until it finally ran Japan and launched a campaign for conquest.

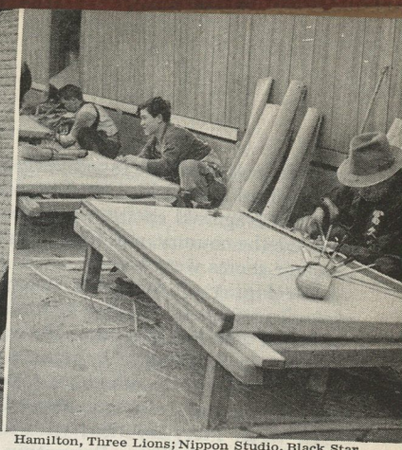
When Japan surrendered in 1945, the Allies ordered political freedom restored in Japan. All people who had been put in prison because of their political beliefs were freed. Freedom of speech and freedom of the press were made part of Japanese policy. All political parties were allowed to function. Political leaders who had worked to get Japan into war with the United States and Great Britain were barred from political office. The most important of these were arrested as war criminals, and many were punished after public trials.

In the first free Japanese elections, held in 1946, the major political parties were the Liberals, the Progressives, the Social Democrats, the Co-operative Democrats, and the Communists. Japanese took a greater interest in elections than ever before in the history of the nation. There were almost 3,000 candidates for seats in the Japanese Diet. More than 25,000,000 men and women voted. Seventy-two per cent of the registered voters went to the polls. Three fourths of the men and two thirds of the women who were eligible to vote did so. There were thirty-eight women among the 464 elected representatives. Japan's first Premier under the new constitution was a Socialist, Tetsu Katayama. He headed a Cabinet which was a combination of members of the Social Democrat, Co-operative Democrat, and Liberal parties.

Allied Occupation. The agreement by which Japan surrendered to the Allies on September 2, 1945, placed the Japanese Government under Allied control. At first, structure of the Japanese Government was not changed. The Emperor, the Cabinet, and the Diet continued to function. But the Japanese Government acted only as an instrument to carry out the orders issued by the Supreme Commander for the Allied Powers. General Douglas MacArthur was named Supreme Commander by President Truman on August 15, 1945. As the agent for the Allied Powers he was instructed to carry out the directives decided upon by the various governments acting through the Far Eastern Advisory Commission. Plans were laid for a peace treaty which would permit the withdrawal of occupation forces and allow the Japanese Government to control its own destiny.

History

660 B.C. Mythical founding of Japan by Jimmu Tenno.
A.D. 552 First Chinese Buddhist priest came to Japan from Korea.
A.D. 794 Imperial Court established at Kyoto; feudal lords took over actual rule.
1543 First Europeans came to Japan.



Hamilton, Three Lions; Nippon Studio, Black Star

The Tatami Is an Important Item in Japanese Furnishing. It is a heavy straw mat on a wooden frame, and serves as the flooring in nearly every Japanese house. The children in the picture at the left are learning how to clean tatamis by beating them. In the picture at the right, several workmen are recovering tatami frames with new straw matting.

1592 Japan unsuccessfully invaded Korea.
1637 All foreigners banned from the country.
1854 Commodore Perry reopened Japan to foreigners.
1867 Emperor regained his powers from feudal lords.
1889 Constitution proclaimed.
1894-1895 Japan went to war with China and took Formosa.
1904-1905 Japan defeated Russia.
1910 Korea annexed.
1914 War declared on Germany.
1931 Japan invaded Manchuria.
1937 Japan invaded China.
1940 Japan joined the Axis in alliance with Germany and Italy.
1941 War declared on the United States, Great Britain, and The Netherlands.
1945 Japan surrendered to the Allies.
1947 New democratic constitution went into effect.

Early History. No one knows much about the early history of Japan. The only history of early times is in the *Kojiki*, or *Record of Ancient Things*, published in A.D. 712. Neither Japanese nor Western historians have any faith in the truth of its stories. The early Japanese were a primitive people who did not know how to write until they learned how from the Chinese, toward the end of the 500's. The stories about their early beginnings are like the myths which are told by word of mouth by all primitive peoples. The *Kojiki* tells of the founding of Japan by the Sun Goddess. It says that Jimmu Tenno, the grandson of the Sun Goddess, became the first Emperor in 660 B.C.

Historians know that Japanese warriors invaded Korea sometime during the 300's or 400's, and ruled part of the country until A.D. 663. The first Chinese Buddhist priest came to Japan in 552. He brought with him Chinese civilization, and introduced a written language and Chinese arts and crafts. Prince Shotoku, who was regent of Japan from 593 to 621, encouraged the spread of Chinese culture. He is often called the "founder of Japanese civilization."

The Rule of the Shoguns. In 794, the Imperial Court was set up at Kyoto, which remained Japan's capital until 1867. But the emperor actually had little of his supposed power and authority. For nearly 1,100 years, different families of feudal lords were the actual rulers of Japan. Sometimes one family ruled the whole country. At other times, two or three families ruled parts of Japan.

The first family to take control of the country was the Fujiwara clan. They ran the government while the emperor spent his time in various ceremonies. In 1192, the Fujiwaras were defeated by the armies of Yoritomo. He set up his *Gakufu*, or military camp, at Kamakura, in eastern Japan. He took the title of *shogun* and ruled Japan in the name of the emperor. Yoritomo's sons were weaklings, and the Hojo family soon conquered them. But they kept the Yoritomos as shoguns, and the Hojos ruled only as regents.

In 1274 the Mongol Kublai Khan sent an armada to invade Japan. A typhoon hit his fleet and destroyed it. The Japanese called this typhoon the *Kamikaze*, or *Divine Wind*. In World War II, in memory of this event, the Japanese called the suicide pilots who dived their planes into Allied warships Kamikaze pilots. Kublai Khan tried again to invade Japan in 1281, but failed.

In 1338, the Ashikaga family took control of Japan and ruled the country for almost 250 years. Civil war ended their rule. A great warrior, Hideyoshi, became regent in 1582, and controlled the country until 1598. Hideyoshi is often called the "Napoleon of Japan." In 1592, he invaded Korea with a plan to build an empire that would include China and India. But Hideyoshi and his armies got no farther than Korea. The Japanese armies withdrew to Japan after the death of Hideyoshi, and the warrior Iyeyasu took control of the government. His family, the Tokugawa, ruled Japan as shoguns until the emperor was restored in 1867.

Foreign Relations. Europeans first heard of Japan from Marco Polo. He returned from China with tales of Cipango, a land of gold and riches. Explorers after Marco Polo tried to reach this land. Columbus was hoping to find Japan when he sailed west from Europe. In 1543, Portuguese sailors were the first Europeans to find the islands. In 1549 a Jesuit priest, Francis Xavier, came to Kagoshima, in southern Kyushu, and began to preach the Catholic religion. The Japanese welcomed him and he made many converts. Other missionaries from Spain and Portugal followed him, and with them came traders from Spain, Portugal, Holland, and England.

At first the Japanese welcomed the foreigners. But in a few years Japan's rulers became suspicious. They feared that the missionaries and traders might be the forerunners of European armies of conquest. The Christians were gradually suppressed until 1614, when Iyeyasu issued an order for all Christian priests to leave Japan and all Japanese to give up Christianity.

In 1637, several thousand Japanese Christians were massacred at Shimabara. Foreign traders were expelled

from the country, and Japan became a hermit country, cut off from the world. One Dutch ship was allowed to come to Nagasaki each year. Japanese were forbidden to leave the country, and foreign sailors shipwrecked on Japan's shores were killed.

The killing of American sailors in Japan aroused American concern. In 1853 Commodore Perry was sent to Japan with four warships. He was instructed to open diplomatic relations with Japan and to force fair Japanese treatment of American sailors and traders. But the Japanese Government resisted Perry's demands.

In 1854, Perry returned with his "black ships" and anchored them in Tokyo Bay within sight of the Shogun's palaces at Yedo, as Tokyo was then called. The Japanese were afraid of American guns, and reluctantly agreed to sign a treaty with the United States. Three years later, Townsend Harris, first United States Consul General to Japan, opened Nagasaki, Yokohama, and four other ports to American trade. Great Britain, France, Russia, The Netherlands, and other countries followed the United States in making treaties with Japan. Japanese isolation from the rest of the world was ended.

Restoration of the Emperor. The treaties with foreign countries caused political unrest in Japan. Many of the feudal lords were opposed to such treaties. The Tokugawa Shogunate was blamed for its weakness in allowing foreigners to gain an entry into Japan. A group of *daimios*, members of the emperor's court at Kyoto, took advantage of this unrest. In a short civil war, they defeated the Tokugawa armies, and in 1867 restored the Emperor to his traditional full powers. The young Emperor Meiji (Mutsuhito) moved his capital to Yedo, which he renamed Tokyo. In 1868 he issued the Charter Oath in which he promised to set up a legislature.

The members of Emperor Meiji's court were progressive. They worked quickly to modernize Japan. They did away with the feudal system and abolished the *samurai*, or warrior class. They set up a modern army and navy. They started schools and made elementary education compulsory. They promoted manufacturing, mining, transportation, and banking. Many European experts were brought to Japan to teach the Japanese how to do things as they were done in Europe. Many ships were built and Japanese world trade began.

The Japanese Government was also modernized. In 1881, Emperor Meiji promised a constitution, which was proclaimed in 1889. In 1890, the first session of the Diet met. Political parties came into being. Commoners entered politics, and in 1918 a commoner for the first time became premier. Labor unions increased. Democracy began to make a little headway.

Japan was a proud nation and wanted to show its strength to the world. Many Japanese believed Japan had a divine mission to rule the world. Japan was also a poor nation. The Japanese who controlled the country's policies decided that force was the best way to make Japanese economy secure.

Foreign Policy. In the 1890's Japan began to adopt a strong foreign policy. The first step was to free Japan from the treaties of extraterritoriality imposed by the United States, Great Britain, and other nations. These treaties allowed Westerners to live in Japan without being subject to Japanese law. The excuse for these treaties was lost with the adoption of the Penal Code of 1880 and the Civil Code of 1890, because these codes provided for just treatment of foreigners in Japanese courts. In 1899, treaties abolished extraterritoriality.

Japan and China became rivals in Korea. This rivalry led to the Sino-Japanese War of 1894-1895, which resulted in a Japanese victory over China. China gave up its claims to Korea, and gave Formosa and the Ryukyu Islands to Japan. China also gave Japan rights in southern Manchuria, but the Western Powers made Japan give back these rights. In 1902, Japan made an alliance with England. Japan thought itself strong enough in 1904 to go to war with Russia over claims to rights in Manchuria. Japan defeated Russia and by the Treaty of Portsmouth, signed in 1905, Russia gave up claims to Korea, and gave Japan the South Manchuria Railway and the southern half of Sakhalin Island.

At the beginning of World War I, Japan declared war on Germany. Japanese forces did not fight in Europe, but Japan took the German-held city of Tsingtao in China and the German-owned islands in the Pacific. In 1915 Japan took advantage of the war in Europe to extend its influence in China by means of the so-called Twenty-One Demands, which were only partially successful. The Versailles Treaty gave Japan a mandate over the Marshall and Caroline Islands in the Central Pacific. These islands had formerly belonged to Germany.

Japan joined the League of Nations and became an enthusiastic supporter. At the Washington Conference in 1921-1922, Japan agreed to limit its navy to a size smaller than the navies of the United States and Great Britain. The Japanese Navy was to have three ships for each five ships in the navies of the United States and Great Britain. Japan also agreed to withdraw from Shantung in China and to sign the Nine-Power Treaty, which guaranteed the territorial independence of China. The Japanese also signed the Kellogg-Briand Pact (1928) and the London Naval Treaty (1930).

The Rise of Militarism. The signing of the London Naval Treaty was the last victory for the liberal Japanese politicians. Emperor Meiji had been a liberal leader, and a real power as Emperor. After his death in 1912, Japanese liberals fought a losing battle with the rising group of militarists. Emperor Meiji was succeeded by Emperor Yoshihito, who was a weakling and who died insane. Hirohito, the son of Yoshihito, was regent from 1921 until his father's death in 1926. The liberal politicians lost the backing of the throne which they had had from Meiji. The militarists gradually took control of Japan, and the army began to act independently.

The Invasion of Manchuria and North China. In 1931, the army thought it was strong enough to strike out for itself. On September 18, 1931, troops of the Kwantung Army created an "incident" near Mukden and began the occupation of all Manchuria. There is evidence that the Japanese Cabinet knew nothing of the army's plans until after the army had acted. Fighting also broke out in 1932 between the Japanese and Chinese at Shanghai.

The United States Secretary of State Henry Stimson tried to get the nations which had signed the Nine-Power Pact to act against Japan, but he was not successful. The League of Nations investigated the Manchurian affair, but took no action except to condemn Japan. Japan withdrew from the League in 1933.

Japan set up a puppet nation in Manchuria which it called Manchukuo. The former Emperor of China, Henry Pu Yi, was named Emperor of Manchukuo. The army proceeded to industrialize Manchukuo. With the success of the Manchurian venture, the army became more confident in its political strength. Military terrorists assassinated Premier Inukai in 1932, and assassinated other liberal politicians in the revolt of February, 1936. From then on, the militarists were in firm control of Japanese policy. They commenced a gigantic propaganda campaign to convince the people that Japan must arm heavily and make itself secure by forming a "Japan-Manchukuo-China bloc." This bloc was later expanded to include other peoples and called the Greater East Asia Co-Prosperity Sphere.

China was the next step in Japan's pattern for conquest. After 1932 Japan extended its influence in northern China. On July 7, 1937, a skirmish at the Marco Polo Bridge near Peiping flared into open warfare between Japan and China. The Chinese fought determinedly, but they were overpowered. By the end of 1938, Japan controlled all northern and central China and had taken Canton in southern China.

Relations with Other Countries. In the meantime, Japan began to co-operate with Germany and Italy. In 1936, Japan signed the Anti-Communist Pact with the other two Axis nations. In December, 1937, Japanese planes bombed and sank the United States gunboat *Panay* in the Yangtze River. After the start of World War II in Europe, Japan exerted pressure against the British to abandon their interests, in north China. In 1938 and 1939, Japanese troops fought Soviet troops along the borders of Manchuria and Siberia. When France fell in 1940, Japan invaded French Indo-China.

The signing of the Soviet-German agreement in August, 1939, shocked the Japanese. But in 1940 the Japanese also signed an agreement with the Soviets. A large Japanese army remained along the Manchurian borders in spite of the treaty between Japan and the Soviet.

As Japanese aggression spread, the United States became less friendly toward Japan. In 1940, the United States cut down its sales of oil and scrap iron to Japan. In answer to this treatment by the United States, Japan signed an alliance with Germany and Italy.

The New Order in Asia. In 1938, Japan had announced its policy of setting up a New Order in East Asia. This New Order called for the removal of Western influence from China, and the close co-operation of Japan, China, and Manchukuo under Japan's direction. China was offered peace on Japanese terms which the Chinese refused to accept. The Diet voted huge appropriations for the Japanese war machine and cut down expenditures for education and agriculture. In 1941, the nation was put on a full wartime basis with rigid control of industry, agriculture, and prices. On October 17, 1941, the semi-liberal cabinet of Prince Fumimaro Konoye fell. General Hideki Tojo became premier. The militarists were in full control. Japan was ready for war.

Japan in World War II. Japan struck on December 7, 1941. Japanese planes bombed the United States fleet at Pearl Harbor. Japanese troops invaded Siam, Malaya, and the Philippines. By the spring of 1942, Japan controlled the Philippines, Siam, Burma, Malaya, the Netherlands Indies, the Admiralties, New Ireland, New Britain, Bougainville, the Solomons, and most of New Guinea. They took Attu and Kiska in the Aleutians. There they were stopped. At the time of its greatest expansion, Japan controlled an area from the Aleutians 4,500 miles south to the Solomon Islands, and from Wake Island 5,000 miles west to Burma.

In May, 1942, the Battle of the Coral Sea stopped Japanese invasion of southern New Guinea. The defeat of the Japanese fleet near Midway in June, 1942, stopped an invasion of that island. From then on, Japan fought a losing battle. It took a year for the United States to build up enough strength to begin to win back territory from the Japanese. But once the United States forces began, they firmly forced the Japanese back.

The opening campaign in the American offensive was the landing on Guadalcanal in August, 1942. The United States eventually retook all the Solomons. The American war machine picked up momentum in early 1944. In a series of campaigns designed to take strategic bases and to bypass the areas of greatest Japanese strength, American forces took points in the Marshalls and Carolines, in the Admiralties, and along the northern coast of New Guinea. Saipan, Tinian, and Guam in the Marianas were taken in June and July, 1944. In October, 1944, the northern and southern arms of the American pincers met in the Philippines, and American troops landed on Leyte. The Philippines were retaken in a campaign lasting about six months.

In the meantime, Japanese air and naval strength was cut down. Thousands of Japanese planes were destroyed. The Japanese fleet was severely damaged in two battles in June and October, 1944. With the capture of the Philippines, Japanese communications with the South Seas were cut, and Japan lost its main source of oil and other important war materials. American submarines and airplanes sank many Japanese ships.

In early 1945, the battle for the Japanese homeland began. Long-range heavy bombers began operating from American bases in the Marianas. Japanese industry was hit heavily and Japanese cities were burned. The capture of Iwo Jima in February, 1945, gave the Allies a base for fighter planes close to Japan. Okinawa, even nearer to Japan, was taken by the Allies in the spring of 1945. The United States and British fleets began operating along the coast of Japan in July. Carrier planes attacked targets inland, and ships bombarded the coast line. On August 6, the first atomic bomb to be used in warfare was dropped on Hiroshima. On August 8, the Soviet Union declared war on Japan and invaded Manchuria and Korea. On August 9, a second and larger atomic bomb fell on Nagasaki.

As Japanese defeats increased, political unrest grew in Japan. On July 19, 1944, the war cabinet of General Tojo fell. Within the year two more cabinets came and went. In July, 1945, the United States, Great Britain, and China announced the terms of the Potsdam Agreement, which stated the conditions under which Japan could surrender. By August, 1945, it was clear to Japanese leaders that Japan was defeated. Japan asked the Allies if the Potsdam Agreement would permit the

emperor to keep his throne. The three countries replied that it would. On August 14, Japan agreed to surrender.

Allied troops began to occupy Japan at the end of August, 1945. On September 2, the Japanese signed the surrender agreement aboard the United States battleship *Missouri*, anchored in Tokyo Bay where Perry's warships had anchored ninety-two years before. The war had cost Japan an estimated 1,850,000 human lives, and about $31,000,000,000.

General Douglas MacArthur was appointed Supreme Allied Commander, serving from 1945 to 1951. During Allied occupation, Japan made progress toward democratic government, and also considerable economic recovery. But Communists made every effort to discredit Japan's new parliamentary government, and inflation held back full-scale recovery. The attempt to break up the great business trusts, or *Zaibatsu*, also delayed economic revival. As a result, in 1948 the standards that apply to American businesses under the antitrust laws were approved for Japanese corporations.

The top policy-making organization for the military government of Japan was the Far Eastern Commission in Washington, D.C., made up of representatives of the United States, Great Britain, the Soviet Union, China, France, Australia, India, The Netherlands, New Zealand, and the Philippines. The Allied Council in Tokyo advised the Allied Supreme Commander on his administration. This council had representatives of the United States, the British Commonwealth of Nations, the Soviet Union, and China. The Soviet Union made repeated efforts to hinder the reconstruction efforts.

After the outbreak of the Korean war in 1950, Japan began to show some signs of economic recovery, partly due to its ability to supply equipment to the United States and non-Communist nations in Asia. In April, 1951, General Matthew B. Ridgway succeeded General MacArthur as Allied commander for Japan. The long-awaited Japanese peace treaty was signed by Japan and forty-eight other nations at San Francisco on September 8, 1951. Provision was made for the end of Allied occupation ninety days after the treaty became effective. Japan's possessions were reduced to its four home islands. Early in 1952, the United States and Japan signed a pact to begin after the peace treaty went into effect. It allowed American armed forces to remain in Japan for that country's protection and to safeguard international peace. In April, 1952, Nationalist China and Japan signed a separate peace treaty. G.B.Cr.

Related Subjects. The reader is also referred to:

BIOGRAPHY

Hirohito
Hiroshige, Ando
Hokusai, Katsushika
Ito, Hirobumi, Marquis
Konoye, Fumimaro, Prince
Kurusu, Saburo
MacArthur, Douglas
Matsuoka, Yosuke
Mutsuhito
Nogi, Maresuke, Count
Noguchi, Hideyo
Oyama, Iwao, Prince
Togo, Heihachiro, Marquis
Tojo, Hideki
Yamamoto, Isoroku
Yoshihito

CHIEF PRODUCTS

Bamboo
Barley
Fishery
Lacquer Ware
Persimmon
Rice
Silk
Soybean
Tea

CITIES

Hiroshima
Kobe
Kyoto
Nagasaki
Nagoya
Osaka
Tokyo
Yokohama

HISTORY

Axis
Boxer Rebellion
China (History [War with Japan])
Chinese-Japanese Wars
Manchuria
Mikado
Perry, Matthew C.
Russo-Japanese War
Shogun
World War I
World War II

UNCLASSIFIED

Ainu
Ancestor Worship
Architecture (Oriental)
Asia (color plate)
Chrysanthemum
Dancing (Oriental Dance)
Doll (color plate)
Domei
Drama (Oriental Drama)
Dress (Japan; color plate, The Orient)
Flag (color plate, Flags of Asia)
Flower (Arrangement)
Fujiyama
Hara-Kiri
Home Life (Japanese)
Japanese Language
Jinrikisha
Jujitsu
Kamikaze
Kite
Painting (Oriental Art)
Races of Man (color plate, Asia and Malaysia)
Sampan
Samurai
Shelter (Japanese Homes)

Questions

What do the Japanese call their country? What does the name mean?

How much of Japan is mountainous? What effect has this had on the country?

What Japanese mountain is world-famous? Why?

What two ocean currents influence Japan's climate? What is the effect of each?

In what ways do the Japanese use bamboo?

What minerals does Japan have?

How are Japan's forests preserved?

How do some scientists account for the small size of the Japanese people?

How are many Japanese houses different from houses in the United States and Canada?

What city is the center of heavy industry in Japan?

What country greatly influenced the early art, literature, and music of Japan?

What is the meaning of *Kamikaze*? How was this term used in World War II?

How did Americans finally secure Japanese permission to trade?

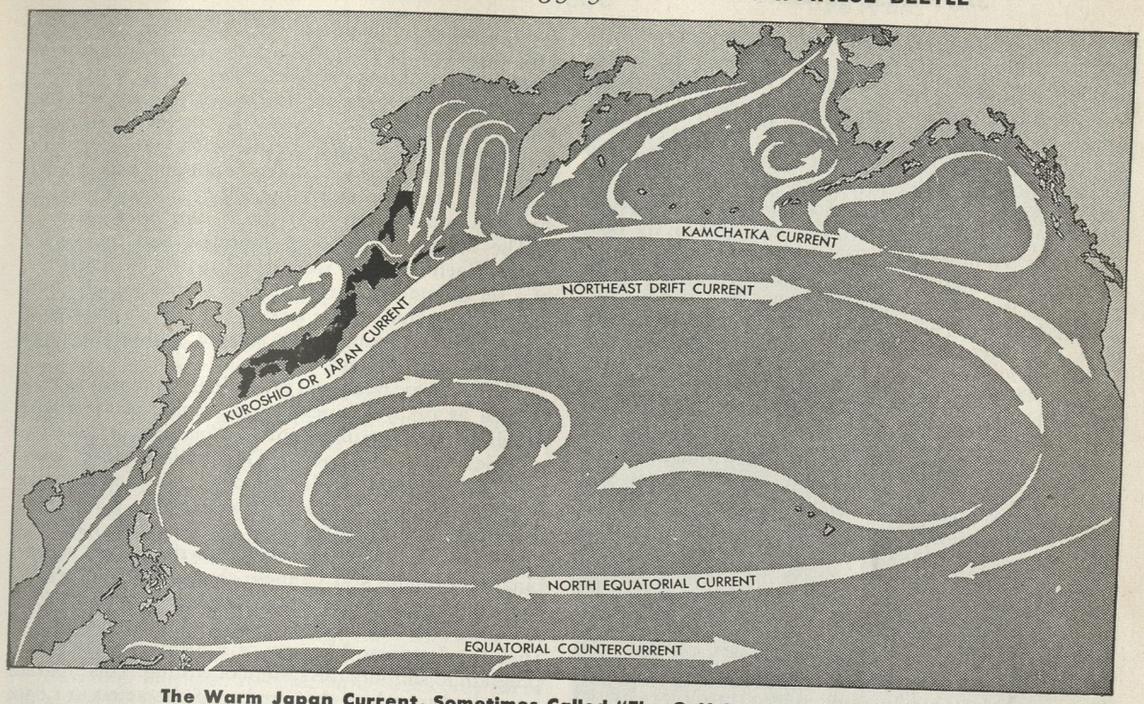
What events ended Japanese resistance in World War II? When and where did Japan surrender?

JAPAN, SEA OF, is an arm of the Pacific Ocean. It separates the islands of Japan from Korea, Manchuria, and the eastern coast of the Soviet Union. The southern end of the Sea of Japan is connected to the East China Sea by the Korea Strait. The northern end of the sea is connected to the Pacific Ocean by Tsugaru Strait and to the Sea of Okhotsk by Soya Strait and the shallow Sakhalin Strait. The Sea of Japan covers about 400,000 square miles. The straits are shallow, but over the greater part of the Sea of Japan the depth exceeds 6,000 feet, averaging 4,500 feet. In some eastern sections, the sea is more than 10,000 feet deep. See also JAPAN (colored map). H.U.S.

JAPAN CLOVER. See LESPEDEZA.

JAPAN CURRENT. This warm, dark-colored current in the Pacific Ocean is sometimes called *Kuroshio*, which is the Japanese word for *black current*. The Japan Current begins near the southeast coast of Asia, where it separates from the larger North Equatorial Current of the Pacific Ocean.

The Japan Current has a warming effect on the climate for most of its course in the Pacific. The current



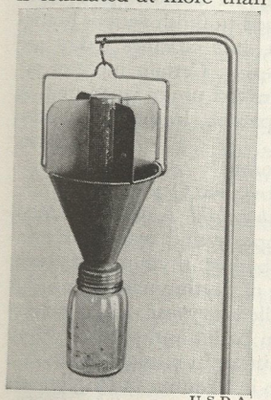
The Warm Japan Current, Sometimes Called "The Gulf Stream of the Pacific"

passes the east coast of Formosa and then changes its course to the northeast and heads toward the eastern coast of Japan. After passing the Kurile Islands, it merges with the easterly moving waters of the North Pacific West Wind Drift. It has, therefore, a much less warming effect on the climate of the northwestern coast of North America than the Gulf Stream has on the climate of northern Europe. H.A.Ma.

See also OCEAN CURRENTS.

JAPANESE BARBERRY. See BARBERRY.

JAPANESE BEETLE. This insect is very harmful to trees, garden plants, and crops. The loss it causes every year is estimated at more than $2,739,000. This beetle is a harmful insect which found its way into the United States in 1916. It probably arrived on the roots of imported Japanese irises. The pest was first observed near Riverton, N.J. It now is found in nearly twenty states. But the Middle Atlantic seaboard is still the most heavily infested area.

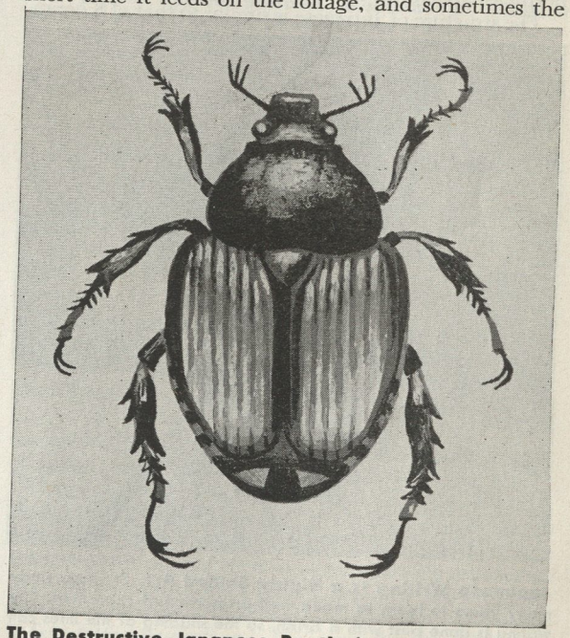


U.S.D.A.

Japanese Beetles are caught in this trap. They enter at the top and then drop into the glass jar at the bottom.

The adult Japanese beetle is less than a half inch long, and about one-fourth inch wide. It has a metallic green oval-shaped body with coppery brown wing covers. It generally lays its eggs in loamy soil. The larva hatches in August or September, and spends the next ten months sleeping and feeding.

The grown insect lives only six weeks. During this short time it feeds on the foliage, and sometimes the



The Destructive Japanese Beetle has spread over more than one third of the states since it arrived in this country during World War I. It attacks a great variety of plant life, and causes millions of dollars' worth of damage each year.

flowers and fruits, of more than 200 varieties of plants. These include ornamental shrubs and vines, flowering garden plants, shade trees, truck and garden crops, field crops, and such fruits as the peach, apple, cherry, and grape.

The United States Department of Agriculture enforces a strict quarantine against the Japanese beetle. It also fights this pest with poison sprays, traps, and parasitic insects, like the digger wasp, which feed on the beetle's grubs. Another method is to inoculate the grubs with Type A milky disease, which kills them. G.P.

See also BEETLE; INSECT (color plate, Beetles).

Classification. The Japanese beetle belongs to the order *Coleoptera* of the family *Scarabaeidae*. Its scientific name is *Popillia japonica*.

JAPANESE CHERRY. See CHERRY.

JAPANESE EXCLUSION ACT OF 1924. See ORIENTAL EXCLUSION ACTS.

JAPANESE LANGUAGE is the native tongue of the people of Japan and the neighboring Ryukyu and Bonin islands. It is also widely understood in former Japanese possessions such as Formosa and Korea. Since 1868, the speech of the city of Tokyo has been spread as a standard language.

The rhythm of Japanese allows an even, metronome-like beat for each syllable. Differences in pitch are the distinctive features of words and phrases, much as differences in stress and emphasis are typical of English. Japanese dialects can be divided into three types, based on pitch-accent patterns. Standard Japanese illustrates the *majority* type. The *Kansai*, or *Western*, type is characteristic of western Honshu, most of Shikoku, and southern Kyushu. The *single-pattern* type is found in northeastern Honshu and central Kyushu.

The structure of Japanese is similar to that of Korean.

Natori, Black Star

Japanese Writing Is a Highly Skilled Art. Students study many years to learn to make well-proportioned characters. The writing is done best with a brush, so the shading of the lines can be varied with slight differences of pressure. The brush is held almost vertically, and the second finger guides the point. With her writing hand on top of the other hand, this Japanese woman can make skilful, beautiful lines.

Both resemble languages of the Ural-Altaic type, which also includes Finnish and Turkish. The origins of these languages are still uncertain.

Japanese is spoken in different styles according to social situations. The *intimate* is correct in everyday conversation. The *polite* is used with cultivated company. The *honorific* style confers honor and respect when spoken. There also exists the *impersonal* style used in speeches and writing, and the *modern literary* style.

The language has both inflected and uninflected words. Each inflected word consists of a stem and one of a set of endings. Among these words are adjectives and verbs, including the linking verbs. The uninflected words include nouns, all the articles, and most prepositions and conjunctions.

The Japanese borrowed the Chinese system of writing, as well as many Chinese words. Some of these were simplified and codified into *syllabaries*, or tables of syllables in written symbols. These syllabaries are called *kana*. Two of them are in use today. The first is a more common, rounded form known as *hiragana*. The second, the square-shaped *katákana*, is used much as italics are in English. Japanese is normally written with a combination of kana and Chinese characters (kanji) called *kanamájiri*. Sometimes kana of reduced size are added alongside a character to show its pronunciation. In 1948 the Japanese Ministry of Education undertook a program to simplify the system of writing. This program attempted to reduce the number of characters to 1,850, and to simplify their shapes.

The Latin alphabet is also taught in Japanese schools, along with three systems of Romanized Japanese. The *Hepburn Romanization* writes consonants like English and vowels like Italian. The other two romanized types, the *National* and the *Nippon-Type*, are both based on the structure of the language itself. S.E.MA.

See also CHINESE LANGUAGE; JAPAN.

JAPANESE MAPLE. See MAPLE.

JAPANESE MINK. See FUR INDUSTRY. (Names of Furs).

JAPANNING, *jah PAN ing*, is a process of varnishing metal, wood, leather, papier-mâché, and other materials in imitation of the lacquer wares of Japan and China. It was once widely used to finish various household articles and ironwares, but coatings today are usually made of synthetic resins. Certain types of art work and crafts still make limited use of japanning. A modified form produces patent leather. See also LACQUER WARE; VARNISH. W.M.MI.

JAPHETH, *JA feth*. See NOAH.

JAPONICA, *ja PAHN ih kah*. See CAMELLIA.

JAQUES-DALCROZE, *zhok-dahl KROHZ*, **ÉMILE** (1865-), is a Swiss composer and teacher. He invented a method of combining rhythm and body movement to create a sense of rhythm and form in his students. This method is called *eurythmics*. It has been used a great deal in modern ballet and physical training courses, and general training in musical theory.

Jaques-Dalcroze was born in Vienna. In 1915 he was named head of the Jaques-Dalcroze Institute at Geneva, Switzerland. M.C.C.

JARDIM, *zhar DING*, **LUIS,** *loo eesh* (1901-), is a Brazilian artist, author, and journalist. His book *The*

Armadillo and the Donkey, for which he drew illustrations of all the characters, is very popular among American children. Two other books, *Maria Perigosa*, a collection of short stories, and *O Boi Aruá*, a collection of folk tales, won literary prizes. Jardim illustrated all his books.

Jardim was born in Pernambuco and was educated by private tutors. He became secretary of the newspaper, *Diario de Pernambuco*. In 1941 he visited the United States as guest of the Department of State. V.CO.

JARDIN DES PLANTES, *ZHAR DAN day PLAHNT*. See BOTANICAL GARDEN.

JARGON in its most common meaning is the speech often used by professional or other groups of people. The jargon of the entertainment world is used by actors, musicians, and ballet dancers. Doctors, dentists, and lawyers often use jargon with each other if they do not want their clients to understand what they are saying. Almost every occupation uses its own special words.

Jargon may also mean a mixture of two or more languages. Pidgin English is a jargon. The word jargon also may be applied to a writer's style. For children, the use of too many big words is jargon. S.M.S.

JARL, *yahrl*. See NORWAY (History).

JAR MUSHROOM. See MUSHROOM (color plate, Mushrooms with Strange and Unusual Shapes).

JARRAH. See AUSTRALIA (Plant Life); EUCALYPTUS.

JARVIS is a small coral island hardly a mile long and even narrower in width. Its coral surface rises only a few feet above the sea. The position of the island, however, makes it an important naval and air observation station to the United States. Jarvis lies just south of the equator, and is one of the group of Line Islands. It is located at 160° Longitude West, about midway between and slightly north of the Society and Samoan islands. In 1936, the United States established a radio station, lighthouse, and weather-observation post on the island.

The island was discovered in 1821 by an English sea captain. Large amounts of guano were taken from Jarvis from 1857 to 1879. Possession of the island was claimed by both Great Britain and the United States until 1936, when Great Britain conceded the island to the United States as a Pacific Ocean defense base. E.E.EI.

JASMINE, *JAS min*. The jasmine is a beautiful white or reddish flower that has a delightful fragrance. It grows on a climbing or erect shrub that belongs to the olive family. The jasmines first grew in the warm parts of the Eastern Hemisphere. They are now often seen in gardens of the southern United States.

The *common white jasmine* is a vinelike plant. It has very attractive dark green leaves and sweet-scented white flowers. This is the jasmine, or *jessamine*, which poets have written about so often.

The *Spanish jasmine* has larger flowers tinged with red underneath. In southern France, the Spanish jasmine is grafted on two-year-old plants of the common white species. The graft results in a bushy plant that has very large blossoms with a strong fragrance, widely used in the manufacture of *oil of jasmine*. Oil from the common jasmine can also be used in perfumes. In China, the flowers of the jasmine are used to scent teas.

The so-called *yellow jasmine* is not a true jasmine, but a gelsemium, and the *Cape jasmine* is a gardenia. J.J.L.

See also GARDENIA; GELSEMIUM.

J. Horace McFarland

The Lovely, Sweet-Scented Blossoms of Spanish Jasmine supply a fragrant oil which is used in making perfumes.

Classification. The jasmines form the genus *Jasminum*, in the family *Oleaceae*. The common jasmine is *Jasminum officinale*. The Spanish jasmine is *J. grandiflorum*.

JASMINE, CAPE. See GARDENIA.

JASMINE, YELLOW, or **CAROLINA JESSAMINE.** See FLOWER (color plate, Woodland Flowers); GELSEMIUM.

JASON, *JAY sun*, was the son of Aeson, king of Iolcus in Thessaly. According to Greek legend, Aeson grew weary of the throne and gave it to his half-brother Pelias. Jason was put under the care of the centaur Chiron. Jason later tried to regain his father's throne. But Pelias got him to go on the voyage of the Argonauts in search of the Golden Fleece.

Jason obtained the treasure with the help of Medea and her tricks of sorcery. Then he fled with her back to Iolcus. There Medea tricked the daughters of Pelias into killing their father, because he had murdered Aeson. Jason and Medea had to flee to Corinth.

Jason left Medea and married Creusa (Glauce), daughter of King Creon. Medea sent to Creusa a beautiful golden robe which had been soaked in poison. Creusa put it on and died in agony. Medea escaped in her dragon chariot after killing her own two children. Jason cut his throat in despair. P.COL.

See also ARGONAUT; GOLDEN FLEECE; MEDEA; THESSALY.

JASPER, a mixture of quartz and iron oxide, is formed in colors of white, red, yellow, brown, and black.

Sometimes these colors are arranged in layers in the rock. Jasper is harder than a knife, and scratches glass. Jasper takes a high polish, and is used for mantels, pillars, and other fancy interior finishings. Fine grades of jasper are polished into gems. The stone is found in many localities, but the most beautiful varieties come from Siberia, Greece, India, Smyrna, and Silesia.

Jasper is mentioned in the Bible as a part of the breastplate of the Jewish High Priest (Exodus 39:13). In Revelations 21:19, jasper is mentioned as one of the twelve stones in the foundation of New Jerusalem. The ancient Greeks and Romans believed that jasper could heal many illnesses and would draw the poison from snake bites. The North American Indians used a jasper-like stone called *flint* to make arrowheads. H.A.Sc.

See also Chalcedony; Quartz.

JASPER NATIONAL PARK. See Canada (Recreation and Outdoors).

JASPER WARE. See Porcelain (illustration); Wedgwood Ware.

JASSY, *YAHS ee*, or **IAŞI.** See Rumania (Cities [Iaşi]).

JASTROW, *JAS troh*, **JOSEPH** (1863-1944), was an American psychologist who did much to establish psychology as a recognized science in America.

He was born in Warsaw, Poland, where his father, Marcus Jastrow, was a famous rabbi. The family moved to the United States in 1866. Joseph was graduated from the University of Pennsylvania. He obtained his doctor's degree at Johns Hopkins University, where he was one of the first students in the first psychology laboratory in the United States.

In 1888 Jastrow organized a similar laboratory at the University of Wisconsin, and remained on the faculty there until 1927. He was a lecturer at the New School for Social Research, in New York City, for six years. He wrote many books on applied psychology, and conducted daily newspaper columns. F.E.C.

JATAKA TALES. See Storytelling.

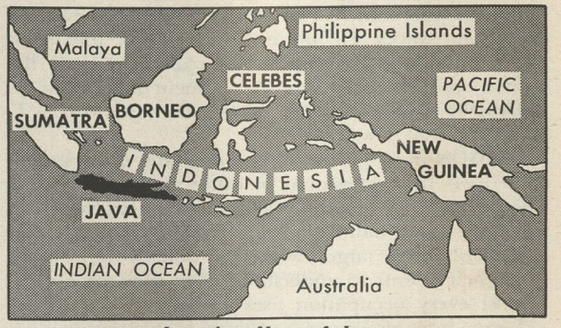
JAUNDICE, *JAWN dis*, is a condition in which the yellow coloring from the bile is deposited in the skin and mucous membranes. It causes yellowness of the skin, eyes, and lining of the mouth. Jaundice is also accompanied by mental depression, nausea, itching, and the presence of bile in the urine. Jaundice is an effect, or symptom, and not a disease. It may be caused by gallstones, inflammation of the bile ducts or gall bladder, or any other condition which affects the bile ducts. Jaundice may be a result of yellow fever, malaria, or several other infectious diseases. It may result from bile pigments being formed outside the liver, or may be caused by cancer of the liver.

Jaundice should be treated as a symptom. An effort should be made to diagnose and treat the cause. Hot baths and sweats are sometimes used to help eliminate jaundice. It sometimes takes weeks, however, to clear up the skin completely. P.R.C.

See also Bile; Gallstone; Liver.

JAUREGG, *YOU reck*, **JULIUS WAGNER VON** (1857-1940). See Fever, Artificial.

JAVA, *JAH vah*, is one of the richest and most densely populated islands in the world. With an area about equal to Ohio, it has over six times Ohio's population. In spite of its large population, which must be fed with home-grown foods, Java is still an important exporter of foodstuffs. Crops grow easily in Java because of a rich volcanic soil, a tropical rainfall, and a long history of good farming methods. It lies between the Sea of Java and the Indian Ocean, close to the islands of Sumatra



Location Map of Java

and Bali. The islands were formerly known as the Dutch East Indies or the Netherlands Indies, and are now part of the Republic of Indonesia. See Indonesia, Republic of (colored map).

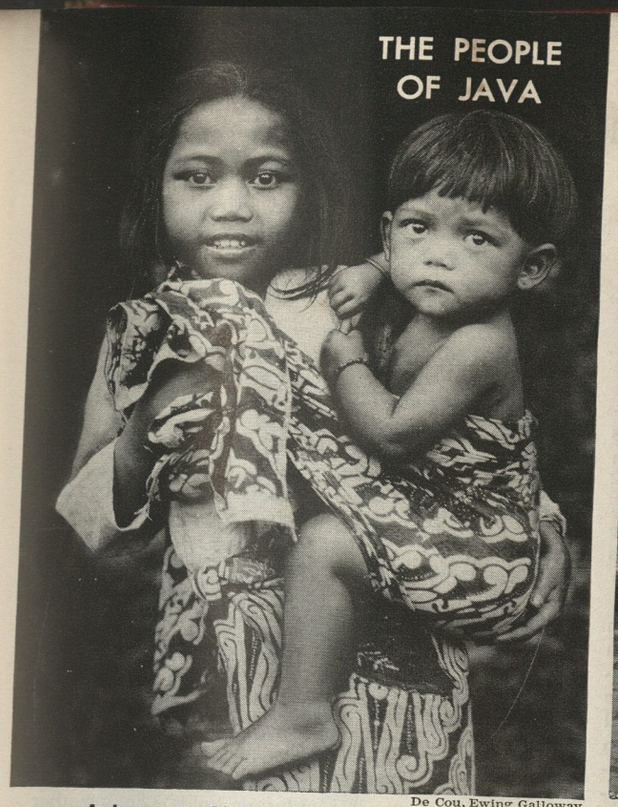
The Land and Its Resources. Java is a long narrow island. Its area is 48,816 square miles. The island is a string of volcanic cones whose lower slopes make a continuous plain. Some volcanic peaks, especially in western Java, are more than 12,000 feet high. The Javanese people still remember the eruption of the volcano Ringhit in 1686, for it killed about 10,000 of their ancestors. In 1883 the dust thrown out from a volcano which erupted on the small island of Krakatoa could be seen throughout the world. Almost every living thing was killed over a large area, and several years went by before plants and animals could thrive there again. Botanists have remarked on the wonderful way in which new seeds arrived by wind and sea to renew vegetable life. In 1901 the eruption of the volcano Kloet destroyed crops and villages as far as 250 miles away.

But the volcanic force on the island has not left Java a barren land. Java's mountains are fertile almost to their peaks. There are many fertile valleys and plains.

The People and Their Work. In Java there are about 50,000,000 persons, an average of about 1,024 to every square mile. The Javanese are small graceful people, with straight black hair. Their skin has a rich brown color—rather like coffee with plenty of cream in it. They are intelligent and hard-working. The Javanese are exceptionally skilled in weaving and dyeing cloth, and in making metal goods of brass and silver. Batik is one of the Javanese methods used to dye cloth. Some parts of the cloth are protected from the dyes by a covering of wax. See Batik.

Javanese men and women are graceful, and are therefore good dancers. Their dances are long and filled with complicated steps and patterns. The famous dancers of Java have appeared in many theaters in all parts of the world. The shadow play rivals the dance in popularity in Java. Javanese audiences sit for hours watching and enjoying the shadows of the puppets as they move like actors through dramas and comedies. The jointed dolls are worked with strings, and their

THE PEOPLE OF JAVA



De Cou, Ewing Galloway

A Javanese Girl, tending her baby brother while their mother works in the rice fields

Sawders

Fishermen and Their Catch in a Harbor of Jakarta, Java's capital. Their oddly shaped sailing boats are called *proas*.

Ewing Galloway

Batik Is a Noted Javanese Handicraft. Hot wax is applied to the cloth with a little pipe. The wax keeps the cloth from taking dye, and thus makes a design.

Ava Hamilton

Court Clowns such as this once entertained the rulers of Java.

agreed to withdraw the garrisons from the northwestern frontier. But the treaty said nothing whatever about the question of the British right to stop and search American ships. Nor did it mention the matter of payment for stolen slaves. The United States agreed that the debts owed to British merchants at the outbreak of the Revolution would be assumed by the Federal Government. The two governments agreed that joint commissions should settle the boundary disputes.

Publication of the Jay Treaty aroused intense anger in the United States. Many persons thought that Jay had made a bad bargain. But the United States in 1794 was in no condition to fight a war, and Great Britain knew it. Jay had labored hard with Lord Grenville to get even the modest treaty he did obtain. Both Jay and President Washington were criticized severely, and Jay himself was even charged with having sold his country to England. E.C.BAR.

JAZZ. See GERSHWIN, GEORGE; MUSIC (Impressionism); POPULAR MUSIC.

JEANES FOUNDATION, popularly known as the JEANES FUND, was incorporated in 1937 under the name of the Southern Education Foundation. The George Peabody and John F. Slater funds were also added in that same year. The Virginia Randolph fund was added in 1938.

The fund is used at the present time to support teachers in rural areas whose salaries are supplied either wholly or partly by the foundation. C.A.

See also SOUTHERN EDUCATION FOUNDATION.

JEANNE d'ARC, *ZHAHN DAHRK.* See JOAN OF ARC, SAINT.

JEANNERET, CHARLES ÉDOUARD. See LE CORBUSIER.

JEAN PAUL. See RICHTER, JOHANN PAUL FRIEDRICH.

JEANRON, *ZHAHN RAWN,* **PHILIPPE AUGUSTE** (1810-1877), was a French painter of figures and landscapes. He was one of the group of painters known as the *Barbizon School.* Jeanron founded the Luxembourg Museum in Paris.

JEANS, JAMES HOPWOOD, SIR (1877-1946), wrote a number of books to explain science to the ordinary reader. He was born in England and was educated at Cambridge University. He specialized in physics and astronomy, and became interested in the nature of gases and sun radiations. Jeans was professor of applied mathematics at Princeton from 1905 to 1909, and lectured during the next two years at Cambridge. In 1923, he was a research associate at Mount Wilson Observatory, California. E.T.B.

His Works include *The Universe Around Us; The Mysterious Universe; The New Background of Science; Through Space and Time;* and *Science and Music.*

Acme

United States Army Jeeps were the "wonder cars" of World War II. They combined the strength and durability of a truck with the driving ease and speed of a light car.

JEAN VALJEAN, *zhahn VAL ZHAHN.* See LES MISERABLES.

JEBEL AYASHI, *JEB el ah YASH ih.* See ATLAS MOUNTAINS.

JEEP. A jeep is a military truck used by the United States armed forces. It is smaller than the so-called "command" car and larger than the sidecar motorcycle used by the army.

Jeep is a slang term for the truck's official name, *General Purpose* vehicle. It has a 60-horsepower motor with four cylinders, and is 11 feet long, 40 inches high, and 62 inches wide. A jeep can carry as many as six persons and can run 65 miles an hour. It can haul half a ton. A jeep has both a four-wheel and a two-wheel drive. The jeep can pull antitank guns and howitzers.

A jeep can move rapidly through mud and water and can bounce over very uneven ground without turning over. It can be used to pump water and air, and to provide power for road scrapers and other devices.

When capitalized, *Jeep* is a trade-mark for a civilian automotive vehicle. F.M.R.

JEFFERS, WILLIAM MARTIN (1876-), worked his way up from office boy to president of the Union Pacific Railroad. He was born at North Platte, Neb., and went to work for the railroad when he was fourteen. His jobs included those of dispatcher, trainmaster, superintendent, and vice-president. He became president in 1937, and retired in 1946.

Acme

William Jeffers, president of the Union Pacific Railroad from 1937 to 1946

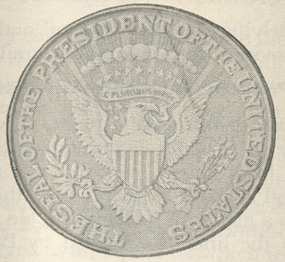
Jeffers put his talents as an organizer and administrator to work in World War II as National Rubber Administrator from 1942 to 1943. He developed the synthetic rubber program which successfully kept the armed forces and the civilian population on wheels. H.U.F.

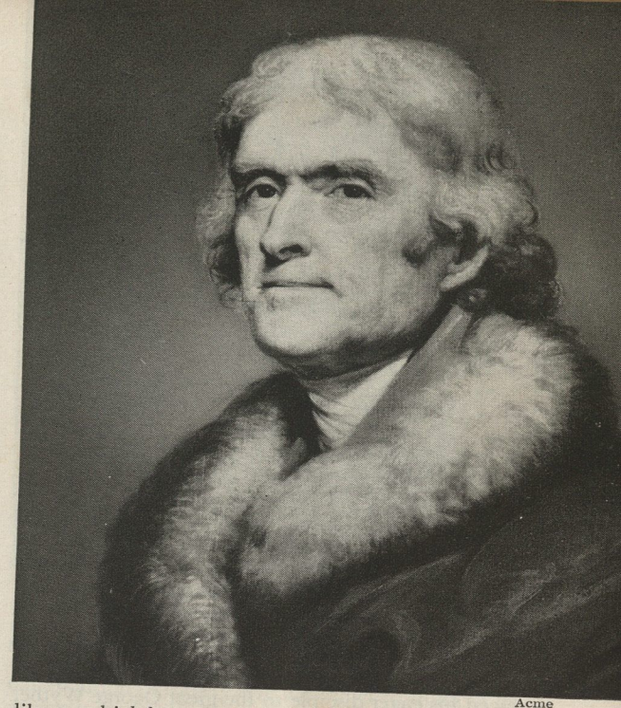
JEFFERSON, JOSEPH (1829-1905), was an American actor. He was best known for his part as Rip in *Rip Van Winkle,* which he played for forty years. Jefferson was called "the dean of the American stage." He also achieved considerable success as a painter of landscapes.

Jefferson was born in Philadelphia, Pa., of a family of actors. His great-grandfather had been a member of Garrick's company at Drury Lane Theatre, London. Jefferson began acting at the age of three. B.M.

JEFFERSON, MOUNT. See OREGON (Physical Features); WHITE MOUNTAINS.

JEFFERSON, STATE OF. In 1915 it was proposed in the Texas legislature that a separate state be made of the Panhandle, or northwestern part of the state. This new state was to be known as the State of Jefferson. The proposal was discussed but did not become law. It was of interest because it brought out the fact that the law which admitted Texas to the Union gave the state the right to divide itself.





Acme

3rd PRESIDENT OF THE UNITED STATES, 1801-1809

JEFFERSON, THOMAS (1743-1826). More than any other man, Thomas Jefferson has formed and molded the American mind and spirit. Every later generation has turned to him for inspiration, and never in vain. "I have sworn," he said, "on the altar of God eternal hostility against every form of tyranny over the mind of man." Through sixty years of public service he was faithful to this vow.

Jefferson was not merely a theorist, but a very practical man. He held that all men were created equal, and did more than any man of his time to bring about equality among men in America. He held that men make government, and he helped to develop the machinery through which men could actually have a share not only in setting up their government but in controlling it. Jefferson cherished liberty in every form, and was largely responsible for the guarantees of freedom of speech, press, and religion in the Federal Constitution and in several state constitutions. He knew as well as anyone that men are not perfect, but he had a deep faith in what the common man might become. Throughout his life he labored to create the social and economic conditions in which men might develop to the limit of their abilities.

The range of Jefferson's interests and talents still excites wonder. Any one of a dozen achievements would have assured him a place in history. He is best remembered as a great President and as the author of the Declaration of Independence. He won fame also as a statesman, diplomat, and political philosopher, and as the founder of the Democratic party.

In addition, he was the foremost American architect of his time. His outstanding architectural works — Monticello, the state capitol at Richmond, Va., and the University of Virginia — had a lasting influence on American and English architecture. He was well known as a scientific farmer, and cultivated the finest gardens of his time. His many inventions included the dumbwaiter and the swivel chair. He was responsible for the convenient decimal system of coinage which allows men to keep accounts in dollars and cents. He collected the finest private library on the American continent — a library which became the nucleus of the Library of Congress. He collected the legal records of Virginia and drafted the civil and penal codes of the state.

Along with all these things, he somehow found time to draft a *Manual of Parliamentary Practice* which is still used, to translate the plays of Aeschylus and Sophocles, to compile his own Bible, and to prepare vocabularies of the Indian languages. He also played the violin and took part in chamber-music concerts.

A distinguished American historian says of him, "More fully than any other figure, Jefferson embodied qualities characteristic of the America of his day and the America that was to be."

Early Life

Thomas Jefferson was born at "Shadwell," Albemarle County, Virginia, on April 13, 1743. His father, Peter Jefferson, was not a member of the landed aristocracy, but he was a capable man. He had served as surveyor, sheriff, colonel of militia, and member of the House of Burgesses, and he owned and cultivated broad estates along what was then the western frontier. Thomas Jefferson's mother, Jane Randolph, was connected with most of the "first families of Virginia," and this connection served to assure young Jefferson of the friendly interest of the leading men of the colony.

Education. Jefferson grew up on the frontier, with the normal interests of a country boy — hunting, fishing, riding, coming to know nature at first hand, as he was later to know it through the library and the laboratory. He began his studies at the age of five. Four years later he took up Latin, Greek, and French. At fourteen, when his father died, he entered the classical school of the Reverend James Maury, one of the best in the colony.

In 1760 Jefferson entered William and Mary College — located at Williamsburg, the provincial capital. Here he had the good fortune to attract the attention of the distinguished professor of mathematics, Dr. William Small. "From his conversations," Jefferson later recalled,

Thomas Jefferson Loved the Outdoors and lived an active life on his parents' plantation. He was an excellent horseman.

"I got my first views of the expansion of science and the system of things in which we are placed." Dr. Small introduced his eager disciple to the great George Wythe, the most learned jurist in the province. (See WYTHE, GEORGE.) "His virtue," wrote Jefferson, "was of the purest tint, his integrity inflexible, and his justice exact; of warm patriotism, and devoted as he was to liberty and the natural and equal rights of man, he might truly be called the Cato of his country."

Wythe quickly became young Jefferson's "faithful and beloved mentor." After Jefferson had been graduated from college, Wythe took him into his office and prepared him for the bar. Meanwhile Jefferson's social horizon was expanding as fast as his intellectual one. He visited with his Randolph kin — notably Peyton Randolph, one of the leading men in the province. He was introduced to the cultivated Governor Fauquier — "the ablest man who had ever filled that office" — who invited him to participate in the "Attic society" of the Governor's mansion and associated him with his chamber concerts.

Early Career. For some years after leaving college Jefferson read law under the guidance of Judge Wythe, and it was during these years that he prepared the foundations for that profound grasp of the law and knowledge of its history which he later used to such good purpose. In 1767 he was admitted to the bar, and thereafter, until public service commanded the whole of his time, he practised with eminent success. In 1772 he married a young widow, Martha Skelton, daughter of John Wayles, who brought him a handsome property. The young couple settled down at Monticello, then only partially built. There on his mountaintop, overlooking some of the most magnificent scenery in the country, Jefferson busied himself with law, farming, and scientific and literary pursuits.

Politics crowded the stage during these years, but Jefferson lived the life of a country gentleman, improving his large estates, building Monticello, probably the most beautiful private house in America, cultivating his garden, experimenting with crops, collecting one of the largest private libraries on the continent, compiling legal records, delving into the political and natural history of the province, and rearing his family.

Political and Public Activities

In the House of Burgesses. Jefferson was not to be permitted the quiet life of a country squire. As early as 1769 he had been chosen a member of the House of Burgesses, and he served there until the Revolution called him to a greater responsibility. He allied himself at once with the liberals who, led by Patrick Henry, were challenging the control of provincial politics by the Tidewater gentry. In the disputes with the mother country, too, Jefferson at once took an active and even distinguished part. Together with other patriots he had met in the Apollo Room of the famous Raleigh Tavern, in Williamsburg, in 1769, and formed a non-importation agreement against Britain.

In 1774 when, after a brief and deceptive lull, the controversy flared up again, he took the lead in organizing another non-importation agreement and in calling for a meeting of all the colonies to consider their grievances. His pen, which was to be enlisted in the cause of liberty for fifty years, was already busy. In 1774 he drew up the famous *Summary View of the Rights of British America* — an argument which took the high ground that Parliament had no control whatever over the American colonies, that allegiance was owed only to the king, and that tyrannical acts by that king would forfeit allegiance. The following year came a masterly *Reply to Lord North*. Jefferson's talents and zeal were recognized, and he was elected as one of the Virginia delegates to the second Continental Congress.

The Declaration of Independence. From the beginning, Jefferson took a leading part in the work of the Continental Congress. After Lexington and Concord, war seemed certain, and Jefferson was asked to draft a *Declaration of Causes and Necessity of Taking up Arms*. This Declaration was "too strong" for the Congress, and the more moderate John Dickinson drafted a substitute which included much of the best part of Jefferson's original.

During the spring of 1776, sentiment in favor of independence grew rapidly stronger. On June 7 Richard Henry Lee of Virginia introduced his famous resolution that "these colonies are, and of right ought to be, free and independent States." Congress appointed a committee consisting of Jefferson, John Adams, Benjamin Franklin, Roger Sherman, and Robert R. Livingston to draw up a declaration of independence. The committee unanimously asked Jefferson to prepare the draft, and, turning "neither to book nor pamphlet," Jefferson drew up the immortal declaration which was accepted with few changes by the committee. On July 2, Lee's resolution for independence was formally passed, and two days later, after an eloquent and passionate defense by John Adams, the Declaration of Independence was approved by the Congress.

The Declaration of Independence is Jefferson's surest guarantee of immortality. With moving eloquence it set forth the basic philosophy of democracy and of constitutionalism — that men are created equal, that they are endowed with inalienable rights, that among these rights are life, liberty, and the pursuit of happiness, that

the purpose of government is to secure these rights, that governments derive their just powers from the consent of the governed, that men have a right to alter, or abolish government and to institute new governments. After more than a hundred and fifty years, these principles are as valid as when they were first announced. Through the years they have served as an inspiration not only for American democracy but for free people everywhere.

As a Social Reformer. "Our Revolution," wrote Jefferson, "presented us an album on which we were free to write what we pleased." In September, 1776, he resigned his seat in Congress in order to return to Virginia and write upon that album a record of far-reaching social reforms.

The Virginia of 1776 was far from a democracy. A landed aristocracy of slaveholders controlled the politics of the state. Land was unevenly distributed, the right to vote was limited, the Episcopal Church was established and favored by law, and education was limited and inadequate. The legal, and especially the penal code was feudal. Jefferson, now the most distinguished liberal in the country, set himself resolutely to overthrow this aristocratic system and make the government, economy, and society of the state democratic.

His first step was the abolition of the system called *primogeniture and entail*, which formed the basis for the landed aristocracy. Under this system, landed property passes intact to the eldest son, so that great estates could not be broken up. "To annul this privilege" wrote Jefferson, "and instead of an aristocracy of wealth . . . to make an opening for the aristocracy of virtue and talent, which Nature has wisely provided for the direction of the interests of society . . . was deemed essential to a well-ordered republic." Since the right to vote was based on landholding, the breaking up of large estates meant also an increase in the number of voters, which in itself was a step toward democracy. Jefferson pushed through these reforms against great opposition.

Another blow at the Tidewater gentry was the passage of a bill which made it easy for immigrants to become naturalized, thus giving citizenship — and the vote — to thousands of Scotch-Irish and Germans who had moved into western Virginia.

Even more important were bills designed to secure religious toleration, disestablish the Anglican Church, and forever separate church and state in Virginia. Here Jefferson met hostility not only from the Anglican interest, but also from other denominations which feared that a separation of church and state would lead to a loosening of all religious ties. But in 1779 the Anglican Church was disestablished. In 1786, after a struggle which Jefferson described as "the severest contest in which I have ever been engaged," the assembly passed the famous Statute of Religious Liberty. This triumph Jefferson counted so important that he directed it be commemorated on his tombstone — along with the Declaration of Independence and the founding of the University of Virginia.

Next Jefferson undertook the complete overhauling of the whole legal system and succeeded in pushing through far-reaching reforms in both the civil and penal code. Then he turned his attention to reform of the suffrage, the expansion of the educational system, and the gradual abolition of slavery. He was blocked in all of these attempted reforms. He was able to win only moderate liberalization of the suffrage. His elaborate plan for a system of free public education culminating in a great state-supported university was defeated, though parts of it later became law. He was no more successful in his attack upon slavery. That institution was too deeply entrenched to be overthrown. The most Jefferson could get was a temporary prohibition of the importation of slaves into the state of Virginia.

Jefferson Had a Great Love of Music and learned to play the violin at an early age. His sister frequently accompanied him on the harpsichord, the forerunner of the piano.

Through these measures Jefferson and his supporters accomplished a bloodless revolution in the economy and society of the Old Dominion. "It is honorable for us," he wrote, "to have produced the first legislature who had the courage to declare that the reason of man may be trusted with the formation of his own opinions."

War Governor. Jefferson was elected Governor of Virginia in 1779, and re-elected the following year. During his administration, the state suffered a disaster for which Jefferson himself was not in the least responsible. At the urgent request of General Washington, he had stripped Virginia of defense in order to aid the Continental cause. In 1780 the state was invaded by the traitor Benedict Arnold, and then by Lord Cornwallis. Governor Jefferson could offer no effective resistance. Indeed, he himself was nearly captured when Tarleton's raiders swept down on Charlottesville. Jefferson did, however, effectively support George Rogers Clark in his heroic campaign to reconquer the Northwest.

Jefferson in Congress. In 1781 Jefferson left the governorship with genuine relief and returned to Monticello. The death of his beloved wife the following year left him stunned and distraught. He resolved to give up public life and devote himself to the education of his daughters. But in 1783 he was elected to Congress. During his one year there, he secured the adoption of a decimal system of currency. He also formulated the Ordinance of 1784 and the Land Ordinance of 1785.

These ordinances formed the basis for the development of the American colonial and land policies. The problem of what to do with western lands had troubled

the colonies from the beginning of the war for independence. By their charters, many of the American colonies had valid claims to land west of the Appalachians, and with the outbreak of the Revolution the states asserted their claims. Titles were conflicting and uncertain, and there was a widespread feeling, especially in those states that did not have title to western lands, that these lands should be surrendered to the central government. In 1780 Congress promised that any lands thus given up by states would be "disposed of for the common benefit of the United States, and be settled and formed into distinct republican states."

Virginia, under the leadership of Jefferson, gave up her claims in 1783, and other states followed this admirable example. Two problems promptly presented themselves: the political organization of the West, and the disposition of the land itself. Congress appointed two committees to consider these problems, and made Jefferson chairman of both.

In 1784 Jefferson brought in a draft of an ordinance for the political organization of the West. It provided for dividing the entire region into sixteen states, eventually to be admitted to the Union on a basis of complete equality with the original thirteen states. A provision in the original draft forbidding slavery in all the territory west of the Appalachians was lost by a single vote. The Ordinance of 1784 was never put into effect but it furnished the basis for the great Northwest Ordinance of 1787. (See ORDINANCE OF 1787.) The report of the committee on land was incorporated into the Land Ordinance of 1785, which provided for the orderly survey of western lands, sale by townships and sections, and the reservation of one section in each township for the support of public schools.

Minister to France. In May, 1784, Jefferson was sent to Europe to join John Adams and Benjamin Franklin in negotiating treaties of commerce. The next year he became minister to France. "It is you, Sir, who replace Franklin?" he was asked. "No, sir, I succeed him; no one can replace him," was Jefferson's reply. Yet Jefferson came as close as anyone could to replacing the honored Franklin. Jefferson was seriously handicapped by what he described as "the non-payment of our debts and the want of energy in our government," but he succeeded in concluding a commercial treaty with France. His mission to London in 1786 to assist John Adams in a similar undertaking was unsuccessful.

Throughout his stay in Europe, Jefferson sought eagerly to broaden his information on all manner of subjects, from architecture to botany, from aeronautics to chemistry. The vast fund of information which he accumulated at this time was a source both of delight and of practical usefulness. He traveled widely in France and Italy, and became familiar with the life of the peasants as well as with that of the aristocracy. He prepared a French translation of his *Notes on Virginia*, wrote a learned essay on English prosody, and drew the plans for the capitol at Richmond. His familiarity with the salons of the ancient regime merely confirmed him in his admiration for the simple virtues of American life.

In Paris Jefferson was a witness to the opening scenes of the French Revolution, a movement which he regarded as similar in purpose to the American Revolution and with which he was disposed to sympathize. But he wanted to go home, and he was recalled in August, 1789. He reached the United States in November of that year and found a letter from President Washington, asking him to accept the position of Secretary of State in the new government.

As Secretary of State. This invitation Jefferson received "with real regret," but finally he yielded to Washington's urging. With Alexander Hamilton, Henry Knox, and Edmund Randolph, he made up Washington's Cabinet. The government at that time was simple. The Cabinet was small, and departmental lines were loosely drawn. As a result, Jefferson's duties and responsibilities were broader than those of most later Secretaries of State.

Sharp differences of opinion and of policy soon showed up, and Hamilton and Jefferson were the chief spokesmen for the two opposing views. "Hamilton," one of our historians has written, "wished to concentrate power; Jefferson to diffuse power." Hamilton feared anarchy and thought in terms of order, Jefferson feared tyranny and thought in terms of liberty. Hamilton believed republican government could succeed only if directed by a governing class; Jefferson, that republicanism was hardly worth trying if not fused with democracy. Hamilton took a gloomy view of human nature; Jefferson the hopeful view of Jean Jacques Rousseau. Hamilton would diversify American economic life, encouraging shipping and creating manufactures by legislative enactment; Jefferson would have America remain "a nation of farmers." Hamilton, in short, emphasized law, order, authority, and property. Jefferson emphasized liberty, democracy, and social welfare. Both were necessary for the new nation, and both left a priceless heritage to the future, but it is Jefferson's buoyant faith and soaring idealism that has meant more to the world. The name "Jeffersonian Democracy" is still given to the dream of a nation of freeholding farmers, living under as little government control as possible.

Hamilton's financial program brought about sharp division in the Cabinet. This division soon led to the foundation of two political parties. Jefferson did not care to challenge Hamilton's plan for funding the national debt, and he was willing to compromise on the issue of the assumption of the state debts. But Hamilton's proposed National Bank alarmed him, partly because he thought it involved an unnecessary increase in the power of the national government, and partly because he feared that such a bank would encourage financial speculation and injure the farming interests of the country. Jefferson firmly believed that "those who labor in the earth are the chosen people of God." and he was equally opposed to Hamilton's scheme for encouraging manufactures.

In the field of foreign relations, Jefferson worked harmoniously with Washington. He urged the recognition of the new revolutionary government of France, but he supported Washington's proclamation of neutrality and agreed heartily on demanding the recall of the obnoxious Citizen Genêt. (See GENÊT, EDMOND C. E.) He argued the American case for having the British leave the northwest forts, and for the free navigation of the Mississippi River. For a fuller discussion

of the issues and events of this period, see WASHINGTON, GEORGE (Administrations as President).

As Party Leader. Jefferson had joined his colleagues in the Cabinet in urging Washington to accept a second term, but he himself was heartily weary of office. He was eager to escape the "hated occupation of politics," and at length persuaded Washington to accept his resignation. In December, 1793, he returned to his beloved Monticello, where he hoped to find happiness "in the society of my neighbors and my books, in the wholesome occupations of my farm and my affairs, in an interest or affection in every bud that opens, in every breath that blows around me, in an entire freedom of rest, of motion, of thought, owing account to myself alone of my hours and actions."

But a life of this kind was not for Jefferson. He was profoundly concerned with what he felt were the monarchic, centralizing, and antidemocratic tendencies of the government, and he busied himself in organizing the opposition. The divisions over the Hamiltonian policies were the beginning of political parties in the United States—the Federalists, who followed Hamilton's lead, and the Republicans (later Democrats) who accepted the leadership of Jefferson.

In his organization of a party, Jefferson revealed an unsuspected skill. He selected able lieutenants in every state, founded newspapers, and established political clubs until he had behind him a well-disciplined and enthusiastic political army. His chief support came from the small farmers, frontiersmen, and Northern artisans—a following perhaps less impressive, but far more numerous than the merchants, financiers, and wealthy planters who made up the Federalist ranks. In 1796, when Washington retired from the Presidency, Jefferson was nominated to that office. He came within three votes of election. John Adams, with seventy-one votes, became President, Jefferson, with sixty-eight, became Vice-President.

As Vice-President. Jefferson took no active part in the new administration, but remained leader of the opposition. As Vice-President he presided over the Senate with dignity and skill. To aid Senate deliberations, he drew up his famous *Manual of Parliamentary Practice* which is still in use. In 1798 the X Y Z Affair played into the hands of the Federalists, and war hysteria persuaded them to pass the Alien, Sedition, and Naturalization Acts. Jefferson held his party together and prepared the counterattack.

Jefferson himself prepared a series of resolutions which were passed by the Kentucky legislature, and his friend Madison prepared a similar resolution for Virginia. These Kentucky and Virginia Resolutions set forth the "compact" theory of the Union and asserted the right of the states to judge when this compact had been broken. They were not, as was later charged, incitements to nullification and secession, but eloquent appeals to the principles of the American Revolution. They were also campaign documents which helped arouse the country against the Federalist infringement of personal liberties. See ADAMS, JOHN; ALIEN AND SEDITION ACTS; KENTUCKY AND VIRGINIA RESOLUTIONS.

Election of 1800. In 1800 the Republicans again nominated Jefferson for the Presidency, with Aaron Burr of New York as his running mate. The Federalists named John Adams and Charles C. Pinckney of South Carolina. The Republicans carried both houses of Congress, and won the Presidency by seventy-three electoral votes to sixty-five for Adams. Jefferson's followers celebrated with bonfires, bell ringings, and patriotic speeches. Their spirits fell, however, when it was found that each Republican elector had cast one of his votes for Jefferson and the other for Burr. Though it was clearly their intention to elect Jefferson to the Presidency and Burr to the Vice-Presidency, there was actually a tie. The election therefore went to the House of Representatives to be settled.

The Federalists still controlled the House, for the newly elected Congress had not yet taken office. Many of the Federalist Congressmen preferred Burr to Jefferson because they thought he was more manageable. But Hamilton, who distrusted Burr even more than he distrusted Jefferson, threw his influence to the support of the Virginian, and Jefferson was elected on the thirty-sixth ballot. One outcome of this bitterly contested election was an amendment to the Constitution by which each elector casts one vote for President and another for Vice-President. Another result was a savage feud between Burr and Hamilton which finally led to a duel in which Hamilton was mortally wounded and Burr was hopelessly disgraced.

Administrations as President (1801-1809)

The election of 1800, Jefferson always insisted, "was as real a revolution in the principles of our government as that of 1776 was in its form." It is easy to understand why Jefferson, with his fear of monarchic tendencies, of the Hamilton financial program, and of association with Britain, believed this. But looking back on that election a hundred and fifty years later, it is clear that it was far from a revolution. Indeed, one might argue that it was scarcely even a change.

There was a change in the spirit of the government, to be sure: a new simplicity, frugality, and democratic faith. But Jefferson spoke more truly when he announced, in his inaugural address, that "every difference of opinion is not a difference of principle. We have called by different names brethren of the same principle. We are all Republicans—we are all Federalists." Actually, government went on much as before. Within a short time the Republicans had adopted—or at least accepted—most of the Federalist institutions. There was no attempt to undo the Hamiltonian program and no official sanction to the doctrines of State rights or of narrow construction of the Constitution. Under Jefferson, indeed, the national government exercised far-reaching powers—powers so great that they actually evoked appeals to State rights from the Federalists.

Cabinet. The new President selected his old friend, James Madison, as Secretary of State, and the Swiss-born Albert Gallatin as Secretary of the Treasury. These three men, talented, liberal, and progressive, formed a triumvirate which ruled the nation for the next ten years or so. Henry Dearborn and Levi Lincoln, both of Massachusetts, became Secretary of War and Attorney General. Gideon Granger of Connecticut headed the Post Office, and Robert Smith of Maryland was put in charge of the Navy Department.

In the matter of patronage, Jefferson held that appointments should be for merit only. But Federalists held all the offices, and Jefferson quickly discovered that "few officeholders die, and none resign." He was forced, in the end, to remove some Federalists, and he generally appointed loyal Republicans to vacancies, so that at the close of his second administration most offices were filled by his followers.

New Policies. With Gallatin's help, Jefferson began a policy of strict economy. Expenditures for the army and navy were cut down sharply. Jefferson believed that government should play the smallest possible role in national life, and he cut down expenses all along the line. As a result, substantial payments were made on the national debt, and at the same time taxes were reduced. The excise tax, which back-country whisky distillers had found offensive, was repealed.

Several other policies of the Adams administration were quickly reversed. The Naturalization Act was liberalized so that once more an immigrant could become a citizen of the United States in five years. The Alien and Sedition Acts were allowed to lapse, and persons who had been fined under the laws got their money back from the government. The Judiciary Act of 1801, which had allowed President Adams to appoint a host of "midnight judges" just before leaving office, was repealed. The new judges Adams had appointed were left with no duties to perform. Moreover, they were also left with no salaries. Jefferson also sent word to those officers appointed by Adams, whose commissions had not yet been delivered, to consider their appointments as never having been made.

A certain William Marbury, who was one of the forty-two justices of the peace appointed for five-year terms in the District of Columbia, sued the Secretary of State for the delivery of his commission. The case itself was of little importance, but it led to one of the most important Supreme Court decisions in American history. On the surface, Chief Justice John Marshall's decision should have pleased the Republicans. The court refused to make Secretary of State Madison deliver Marbury's commission. It also held that the Judiciary Act of 1789, which gave the Supreme Court power to deal with cases of this kind, was unconstitutional.

There was nothing in this decision itself to disturb Jefferson or his followers. But the principle that the Supreme Court had a right to set aside laws of Congress which it considered unconstitutional was very disturbing indeed. It placed a powerful weapon in the hands of the judiciary, which was still controlled by the Federalists. Many Republicans feared that the Supreme Court would make use of its power for its own party by nullifying on constitutional grounds any act of Congress which the members of the court disapproved.

Jefferson himself had been shocked by the appointment of the midnight judges, and outraged by the role of the Federal judiciary in the enforcement of the Alien and Sedition Acts. The Republicans cast about for some way of checking the great power of the Federal courts, "that last stronghold of Federalism." They thought they had found a weapon in the constitutional provision for impeachment. Impeachment proceedings were brought against a number of Federal judges in Pennsylvania. A New Hampshire judge named John Pickering was convicted by the Senate on charges of gross misconduct and removed from office.

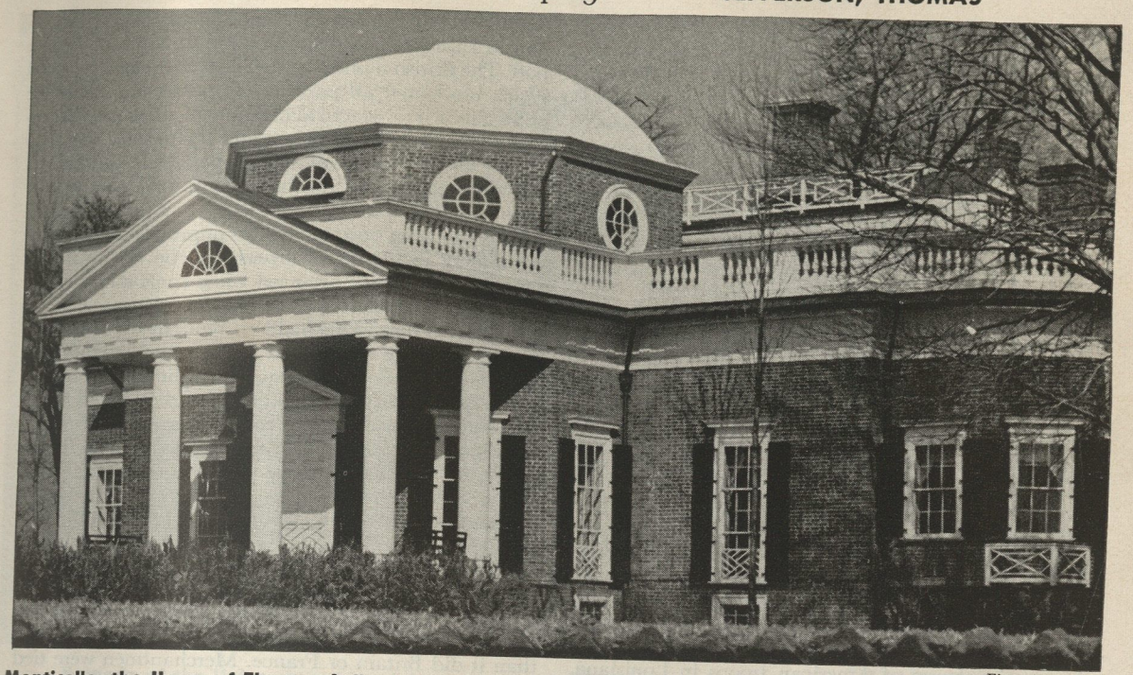
The House then brought impeachment charges against Justice Samuel Chase of the Supreme Court. Chase was a signer of the Declaration of Independence and a hero of the Revolution. Several Republican editors prosecuted under the sedition law had been tried before Justice Chase, who was an ardent Federalist. There was no question that Chase had been biased in his conduct of these trials. During the trials he made speeches to juries on the evils of Republicanism which would soon bring ruin upon the land. Jefferson was eager that Chase be convicted, but the Senate acquitted him.

War with Tripoli. Curiously enough, in view of Jefferson's passion for economy, for strict construction, and for peace, the most brilliant achievements of the administration were in the realm of war and diplomacy. Ever since Jefferson had been minister to France, he had urged action by the United States, alone or with European powers, against the Barbary pirates who preyed upon commerce, demanding tribute and ransom from all the powers. In 1801 Jefferson decided that the policy of tribute was no longer tolerable, and opened war on Tripoli, the most unruly of the Barbary states. The little American navy blockaded the Tripolitan ports, bombarded their fortresses, and eventually forced that pirate power to respect the American flag.

The Louisiana Purchase. One of the greatest achievements of Jefferson's administration was the purchase of the vast territory between the Mississippi and the Rocky Mountains known as Louisiana. Louisiana had been transferred from France to Spain in 1763. In 1801 Jefferson was alarmed by the rumor that Spain had handed Louisiana back to France—a rumor which soon proved to be true. Louisiana in Spanish hands was harmless. Under the control of Napoleon, it might prove a permanent barrier to American expansion and a threat to American democracy. "The day that France takes possession of New Orleans," Jefferson wrote, "we must marry ourselves to the British fleet and nation." Few prospects could have given Jefferson less pleasure. It seemed much better to keep France from taking possession of New Orleans.

In 1803 Jefferson got two million dollars from Congress for "extraordinary expenses," and sent his old friend James Monroe to Paris to help the American Minister, Robert R. Livingston, in his dealings with France. Jefferson hoped to buy New Orleans and the Floridas, or at the very least to get a perpetual guarantee of free navigation of the Mississippi and the right of deposit at New Orleans.

Circumstances helped out the American negotiators, and made France eager to come to terms. What plans Napoleon may have had for Louisiana no one knows. But in 1801 the Negro leader, Toussaint l'Ouverture, revolted against French rule in Haiti and Santo Domingo. Napoleon poured 35,000 men into the island, but yellow fever and the Negroes wiped out most of them. It seemed impossible that France could hold permanent control of Louisiana without control of



Eisenstaedt, Pix

Monticello, the Home of Thomas Jefferson, is on a high hill near Charlottesville, Va. The building was begun in 1770, but it took thirty years to complete. Many of the materials and furnishings were brought from England, Italy, and France. Thomas Jefferson lies buried in the grounds of his beloved home, for which he yearned during the years he served his country at home and abroad. Many of the clever inventions of the "Sage of Monticello" are kept in his home.

Santo Domingo. And it seemed clear in 1803 that France would soon be at war with England again. Napoleon decided to get rid of his American holdings, which he seemed likely to lose in any case, and give his full attention to Europe.

When the American commissioners proposed a modest purchase of New Orleans, Talleyrand astounded them by asking, "What will you give for the whole of Louisiana?" A bargain was quickly struck. The United States got the entire province of Louisiana for $11,250,000, and agreed to give up American claims on France estimated at $3,750,000. Thus, for about fifteen million dollars the United States acquired control of the Mississippi and a domain of over 800,000 square miles.

Jefferson was surprised when he found out what his ministers had done. He doubted whether the national government had a right under the Constitution to add this vast new territory to the Union. But his doubts did not keep him from submitting the treaty to the Senate, where it was ratified by a vote of twenty-six to five. The House of Representatives showed its approval of the purchase by voting, ninety to twenty-five, the funds needed for carrying the treaty into effect. See LOUISIANA PURCHASE.

Lewis and Clark Expedition. Even the vast Louisiana territory did not fully satisfy Jefferson's ambition for a great landed democracy. In 1804 he sent Meriwether Lewis and William Clark on an expedition to the headwaters of the Missouri River and then across the Rockies to the Pacific. The scientific purpose of the expedition did not entirely conceal its political and territorial meaning. In 1806 Lieutenant Zebulon Pike, who had just explored the headwaters of the Mississippi, was sent on an expedition into what is now Colorado. The suspicious Spaniards captured him when he entered their territory, but later released him.

Land Policy. Jefferson was eager to secure new territories for the United States, and also to get them settled. The population of the Northwest Territory grew so rapidly that Ohio was admitted to the Union as the seventeenth state in 1803.

In 1804 western settlement was further encouraged when the minimum unit of sale of western land was cut in half (from 320 acres to 160 acres), so that any man with eighty dollars in cash could make the first payment on a frontier farm of his own. The movement of settlers into the Northwest and Louisiana Territories was a mere trickle compared with the great westward movement that was to come, but it kept growing steadily. Meanwhile Jefferson, who had tried to buy the Floridas in 1803, kept on with his effort to secure West Florida from Spain.

Election of 1804. Jefferson's first administration had been highly successful in every respect. Foreign relations were good with every country except Spain, and foreign commerce had grown rapidly. All signs pointed to a steady growth in wealth and population, and the American people were content. Jefferson's re-election in 1804 was assured.

A number of northeastern Federalists felt that the time had come to break up the Union, rather than face four more years of Republican control. They found a

willing tool for this scheme in the Vice-President, Aaron Burr. Jefferson had never forgiven Burr for his willingness to accept the Presidency in 1800, and Burr had lost all his influence in the Republican party. When a number of Federalists suggested that he become their candidate for governor of New York in 1804, Burr saw a chance to recover his lost prestige. The plotters wanted to elect Burr so that he could help to take New York and New England out of the Union.

Alexander Hamilton learned of the plot and exposed it. The Federalists were already weak, and suffered a further loss of support. They were completely overwhelmed in the election. Even New England, except for the state of Connecticut, went over to the Republican camp. The final electoral vote was 162 for Jefferson to 14 for C. C. Pinckney, the Federalist candidate.

The Burr Conspiracy. Aaron Burr, thoroughly discredited in politics, completed his own ruin by killing Hamilton in a duel. Burr was an adventurer at heart, and he now thought up a wild scheme which may have involved detaching the West from the United States and perhaps the conquest of the Spanish Southwest. He was unable to get help from the British, French, or Spaniards in his plot, and raised a small force of his own. In 1806 he set off down the Ohio River for New Orleans, hoping to gather recruits as he went. He had been led to expect some support from General James Wilkinson, who was in charge of American troops in Louisiana. Wilkinson had been, and probably was at the time, in the pay of Spain. He was certainly a schemer and may have been a traitor, but he decided to expose Burr's plot instead of joining him.

Burr was captured, taken to Richmond, and tried for treason. To the disgust of Jefferson and others, Chief Justice Marshall insisted upon so narrow an interpretation of treason that Burr had to be acquitted. He fled to Europe, a ruined man.

The Struggle for Neutrality. War between Great Britain and France broke out soon after the Louisiana Purchase. From that time on, President Jefferson's chief task was to keep the United States out of the war, and at the same time uphold the country's rights as a neutral. Britain and France were busily destroying each other's merchant shipping, so that a large part of the trade from the West Indies to Europe fell into American hands. The profits of blockade running brought fabulous returns to owners whose ships were lucky enough to escape capture.

The American shipbuilding industry grew rapidly, and thousands of sailors were in demand. Most of these sailors came from New England, but the American merchant marine got a great many sailors who had deserted from British vessels. It is estimated that between thirty and forty thousand British seamen shipped on American vessels in the course of the war. Britain was desperately in need of sailors, and began the practice of stopping American vessels on the high seas and taking off all who were suspected of being British. Unfortunately, British seamen and American seamen looked very much alike. Thousands of Americans were seized and forced into service in the British Navy.

The struggle in Europe soon became so intense that neither side cared much about neutral rights. In the Berlin and Milan decrees, Napoleon announced his intent to seize all neutral ships bound to or from a British port. The British replied with a series of orders in council which blockaded all ports in the possession of France or her allies. The practical meaning of these pronouncements was that the British would try to seize any ship bound for the continent of Europe, while the French would do their best to seize ships bound almost anywhere else.

The crowning outrage was an unprovoked attack on the American frigate *Chesapeake* by the British frigate *Leopard*. The attack occurred when the captain of the *Chesapeake* refused to permit the British to search his crew for deserters. This incident brought the two countries to the verge of war, but Jefferson preferred further protest and economic pressure to military action.

The Embargo. Jefferson knew that the United States was not prepared for war. In any case, it would have been hard to decide which country to fight. Jefferson believed that he could bring the warring powers to reason by closing the American markets to them and depriving them of American supplies. He forced through Congress an embargo act which practically stopped foreign trade with the United States.

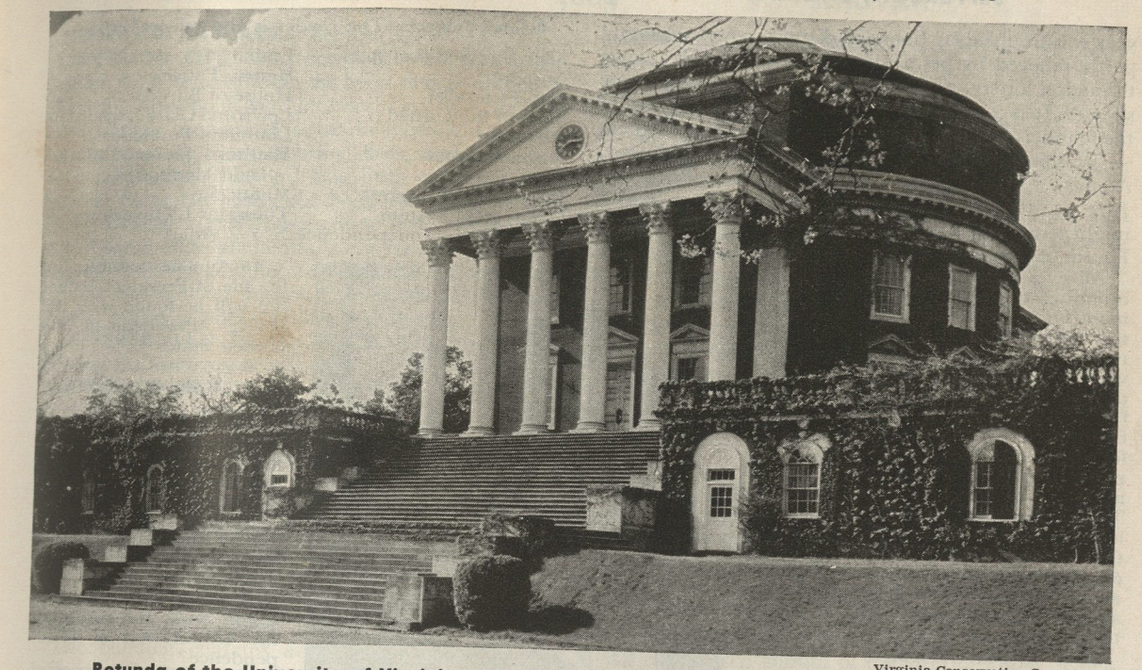
This experiment in the use of "measures short of war" foreshadowed the use of economic sanctions in the 1900's. The embargo injured the United States far more than it did Britain or France. Merchantmen were tied up at the wharves, sailors and shipwrights were thrown out of work, and tobacco, wheat, and other exports piled up in the warehouses. At the same time the embargo was widely evaded, especially by the Massachusetts shipmasters who were ready to run all risks in return for the dazzling profits of a successful voyage. After fourteen months, it became clear that the embargo would force no concessions either from Britain or from France. Public clamor against the measure became overwhelming, and it was repealed on March 1, 1809.

Jefferson was bitterly disappointed over the failure of the Embargo Act. His second term, which began, as he himself said, "without a cloud on the horizon," was drawing to a far less hopeful close. Many urged him to run again in 1808, but Jefferson chose to follow Washington's example and retire from office at the end of his second term. He made it clear that he expected his Secretary of State, James Madison, to be the next President. Madison was easily elected, but the Federalist candidate, C. C. Pinckney, got more than three times as many electoral votes as he had received in 1804.

Later Life

The Sage of Monticello. Jefferson was sixty-five years old when he retired from the Presidency. He had given forty years of his life to public service, and felt free at last to cultivate those "tranquil pursuits of science" for which, he said, Nature had intended him. "Never did a prisoner released from his chains feel such relief as I shall on shaking off the shackles of power," he wrote.

Jefferson's estate was run down, and his finances were in a deplorable condition. He turned energetically to repairing the damages of long neglect. He experimented with new crops and new techniques of farming. He was a passionate gardener, and ceaselessly improved his



Virginia Conservation Commission

Rotunda of the University of Virginia at Charlottesville. It Was Designed by Thomas Jefferson.

flower and herb gardens until they were as lovely as anything in America. Leisure gave him a chance to indulge his countless and varied interests — music, architecture, chemical experiments, the study of religion and philosophy, law, and education.

Jefferson was a great reader, and enjoyed books on many subjects. His library at Monticello contained a collection of almost ten thousand volumes. He sold the books to the United States Congress in 1814, to replace the books which the British burned when they set fire to the Capitol. Jefferson was at that time in need of funds to carry on his improvements at Monticello, and welcomed the fee Congress paid him for his scholarly collection. He refilled his library shelves with books he had kept in storage for many years at Williamsburg, Va. Jefferson was always ready to lend any of his books to his friends.

Jefferson found time for an ever-growing correspondence, and for the entertainment of the endless stream of guests who came to pay tribute to the sage of Monticello. "My mornings," he wrote, "are devoted to correspondence. From breakfast to dinner I am in my shops, my garden, or on horseback among my farms; from dinner to dark, I give to society and recreation with my neighbors and friends; and from candle light to early bedtime I read."

The burden of correspondence and of entertainment was a heavy one, but there were compensations even here. In 1811 he was reconciled with John Adams. "I always loved Jefferson," said Adams, "and still love him." When Jefferson heard this, he hastened to renew his old friendship. The correspondence between the two men continued up to their deaths, which occurred on the same day. It ranged over the whole field of history, politics, philosophy, religion, and science, and is perhaps the most interesting in American letters.

Jefferson had withdrawn completely from politics, but he was consulted constantly on public affairs. Madison and Monroe, his successors in the White House, frequently sought his advice. Virginia liberals who were anxious to rewrite the state constitution turned to him for support. He was constantly consulted on such matters as slavery, the method of curbing judicial power, and university education.

The University of Virginia. It was perhaps in the field of education that Jefferson made his most important contributions during his later years. His interest in the subject was of long standing: he had labored in his youth for a reform of the whole system of public education in Virginia, and had later sought to improve William and Mary College. In the end he became convinced of the necessity of establishing an entirely new university.

From the time he retired from the Presidency until the time of his death, he worked ceaselessly on this project. His ideal was a university "based on the illimitable freedom of the human mind to explore and to expose every subject susceptible of its contemplation," and this ideal he largely achieved. The University of Virginia was his creation. It was the projection of his character, his interests, and his talents. He drew up the curriculum, engaged the faculty, selected the books for the library, drew the plans for the buildings, and superintended their construction. The result was the most progressive curriculum, the best faculty, and by far the most beautiful group of buildings and the handsomest landscaping in the country. In March, 1825, Jefferson had the joy of seeing the University open with forty students.

Already, however, his strength was failing. His last

year was troubled by financial distress, which was only partly relieved by permission to sell some of his lands through a lottery, and by gifts from public and private sources. It is a striking commentary on the integrity of the founders of the American republic that most of them — Washington, Jefferson, Hamilton, Madison, Monroe, Adams — retired poor from long public service. On June 24, 1826, Jefferson penned his last letter, which might serve as an index to his whole career. It was for a Fourth of July celebration, and he wrote:

All eyes are opened, or opening, to the rights of man. The general spread of the light of science has already laid open to every view the palpable truth that the mass of mankind has not been born with saddles on their backs, nor a favored few booted and spurred, ready to ride them legitimately by the grace of God. These are grounds of hope for others. For ourselves, let the annual return of this day forever refresh our recollections of these rights, and an undiminished devotion to them.

And on that Fourth of July in 1826, just fifty years after the Declaration of Independence, Jefferson's life quietly ended. H.S.C.

Press Association

Martha Jefferson Randolph, daughter of Thomas Jefferson, often presided as White House hostess during her father's administration, sharing these duties with her sister Mary. Dolly Madison, wife of Jefferson's Secretary of State, also sometimes served as hostess for the widowed President at social functions.

Martha Skelton Jefferson became Thomas Jefferson's wife in 1772. She was a charming widow of twenty-four, noted for her beauty, intelligence, and accomplishments. Her father was John Wayles, a wealthy Virginia lawyer. From him she inherited forty thousand acres of land and 135 slaves.

The Jeffersons spent busy, happy years at Monticello. In 1782 Mrs. Jefferson died, leaving their three daughters to her husband's care. One daughter died two years later. The other two, Martha and Mary Jefferson, were educated in European convents. Martha married her cousin, Thomas Mann Randolph, who was later governor of Virginia. She brought up a large family of children, and was Thomas Jefferson's companion during his years of retirement. One of Martha's children, James Madison Randolph, was born while she was visiting her father in Washington. He was the first child born in the White House. An older son, Thomas Jefferson Randolph, helped his famous grandfather in the management of his personal affairs after Jefferson had retired to private life. Randolph also administered Jefferson's estate.

Jefferson's wife had been dead for nineteen years when he became President. Neither of his daughters could be with him in Washington except for visits, so Dolly Madison, wife of the Secretary of State, acted as mistress at the White House. President Jefferson later abolished official receptions as not suitable to his democratic principles, but Mrs. Madison continued to act as hostess at state dinners and similar functions.

Related Subjects. The reader is also referred to:

Alien and Sedition Acts	Embargo
Anecdote	Henry, Patrick
Anti-Federalist	House of Burgesses
Bank of the United States	Lewis and Clark Expedition
Barbary States	Louisiana Purchase
Burr, Aaron	Madison, James (Dorothy Todd Madison)
Continental Congress	Monticello
Continental System	Toussaint L'Ouverture
Declaration of Independence	X Y Z Affair

An Outline suitable for the life of President Jefferson will be found with the article "President of the United States."

Questions

What three achievements did Jefferson want noted on his tombstone?

What were some of Jefferson's inventions?

Where did Jefferson live during his early married life? What were his activities?

To what extent was Jefferson really the author of the Declaration of Independence?

What reforms did Jefferson bring about in Virginia after 1776?

What disaster did Virginia suffer while Jefferson was governor?

What were Jefferson's chief accomplishments during his one year in Congress in 1783?

Why was Jefferson sent to France in 1784?

How were the political beliefs of Hamilton and Jefferson widely different?

How did Jefferson prove himself efficient in party politics?

What were the Kentucky and Virginia Resolutions? What effects did they have?

What dispute arose over Jefferson's election? What was the result of this dispute?

Why did Jefferson find it difficult to appoint people to office for merit alone?

What policies of Adams did Jefferson reverse?

What part did Jefferson play in the affair with Tripoli?

What important land purchase did Jefferson manage? What price was paid? Why was France so willing to sell this land?

How did Jefferson promote exploration of the West? How did he encourage settlement?

How did the United States become involved in the war between France and England before 1812?

Why did Jefferson favor the Embargo Acts? Why did they fail?

What statement did Jefferson make that shows his feeling about leaving public office?

Who served as mistress of the White House while Jefferson was President? Why?

JEFFERSON BARRACKS. See ST. LOUIS.

JEFFERSON CITY, Mo. (population 25,099), is the capital of the state. It lies in the heart of rich farm lands along the Missouri River. Jefferson City is an agricultural trading center and a manufacturing town. Its factories produce shoes, clothing, flour, and beverages. Two railroads and several bus lines enter the city. Lincoln State University for Negroes, Jefferson City Junior College, Algoa Intermediate Reformatory, and the Missouri state penitentiary are located here. The Capitol is an outstanding architectural feature of the city. It was built of Missouri limestone in the early 1900's. Jefferson City was founded in 1825. R.Sc.

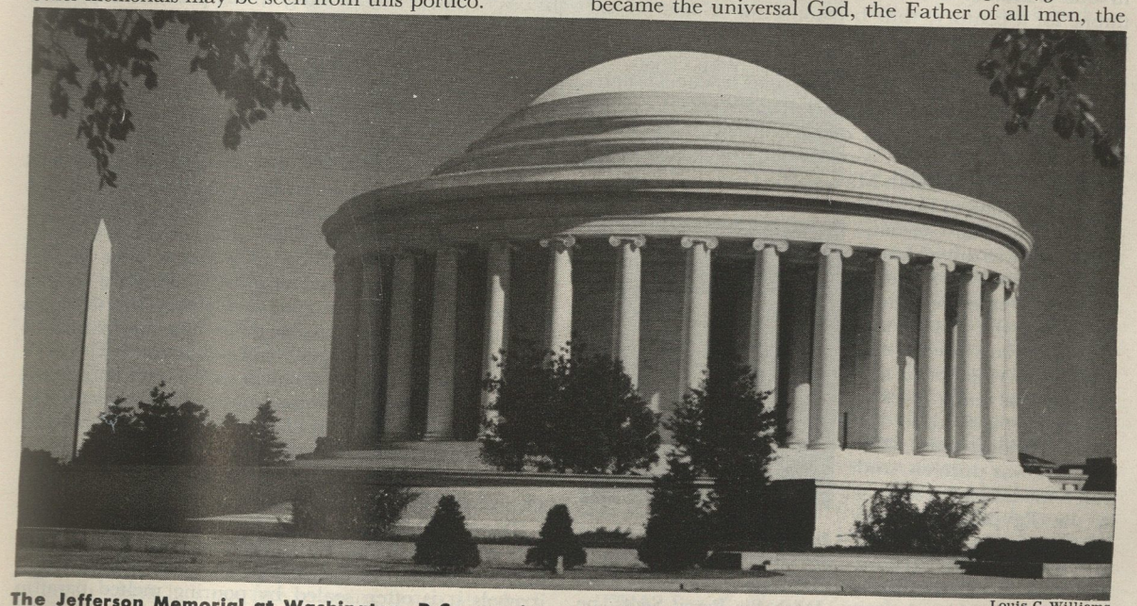
JEFFERSONIAN DEMOCRACY. See JEFFERSON, THOMAS (As Secretary of State).

JEFFERSON MEMORIAL. This shrine to the third president of the United States is one of a group of three memorials to famous Americans in Washington, D.C. The other two units are the Washington Monument and the Lincoln Memorial.

The memorial is a white marble building on the south side of the Tidal Basin near the Potomac River. It was completed in 1941 at a cost of $3,000,000. The shrine was dedicated on April 13, 1943, the 200th anniversary of the birth of the author of the Declaration of Independence.

The building contains an eighteen-foot statue of Jefferson. Quotations from the Declaration of Independence and other writings by Jefferson are carved on the wall panels of the shrine.

Two circular terraces surround the memorial. There are three broad flights of steps, with level platforms at intervals, leading from the edge of the Tidal Basin to the portico. The portico is supported by twelve columns, eight of which are across the front. The other memorials may be seen from this portico.



Louis C. Williams

The Jefferson Memorial at Washington, D.C., was designed by John Russell Pope in the classical style that Jefferson liked so well, and was dedicated in 1943 on the 200th anniversary of Jefferson's birth. This stately memorial completes the famous kite-shaped "L'Enfant plan," of which the White House, Capitol, Lincoln Memorial, and Washington Monument are parts.

JEFFREYS, *JEF riz,* **GEORGE** (1648-1689). See MONMOUTH, JAMES SCOTT.

JEFFRIES, JAMES J. See BOXING.

JEFFRIES, JOHN (1744-1819). See BALLOON (Important Early Ascents).

JEHAN, *jeh HAHN,* or **JAHAN, SHAH.** See SHAH JAHAN.

JEHOIAKIM, *jee HOY ah kim* (? -598? B.C.), was king of Judah from about 608 B.C. until his death. In 605 B.C. he led a revolt against the Babylonian king who then ruled Palestine, and died in the siege of Jerusalem that followed the uprising.

JEHOL. See CHINA (colored map); MANCHURIA (Manchuria and World War II).

JEHORAM, *jee HO ram* (d. 843?B.C.). See JEHU.

JEHOSHAPHAT, *jee HOSH ah fat,* (? -851? B.C.) was one of the best kings of Judah, the ancient land of the Jews. He ruled for more than twenty years in the middle of the ninth century B.C. The people prospered during this time. Jehoshaphat showed political good sense when he agreed with King Ahab to end the warfare between the Hebrew kingdoms. But this policy had less happy results. It led to the marriage of his son, Jehoram, to Athaliah, the daughter of Ahab. This princess cared no more for Jewish ways of life than her mother Jezebel had. Her indifference was resented by the people. Jehoshaphat won control of the land of Edom, which had iron and copper mines. The wealth of these mines doubtless contributed to Jewish prosperity and to the king's fame as an able ruler. W.A.I.

JEHOVAH, or **YAHWEH,** is one of the Old Testament names of the Supreme Being of the Hebrews. At first Jehovah was probably only a tribal god of the Kenites, who dwelt in Canaan in the time of Abraham. But under Samuel, Isaiah, and the other Prophets, Jehovah became the universal God, the Father of all men, the

source of righteousness. The name Elohim was frequently used by the psalmists, but the name Jehovah had a deeper significance as Redeemer. Many of the ancient Hebrews avoided pronouncing the divine name by using, instead, the term *Adonai*, meaning *the Lord*. See also JEW; JUDAISM. L.L.M.

JEHOVAH'S WITNESSES are members of a religious group known officially as the Watch Tower and Bible Society. Members do not consider their movement to be a religion. They believe that righteousness will eventually rule on earth. There is strong emphasis on reading the Bible. Witnesses do not accept the doctrine of the Trinity. They refuse to vote, salute the flag, or go to war, because they feel that these actions conflict with loyalty to God, or Jehovah. All members are required to "publish" or "witness" their beliefs to others.

The movement was formally organized in 1872 by Charles Taze Russell, in Pittsburgh, Pa. It was incorporated under its present name in 1939. Local groups meet in "companies" in Kingdom Halls. There are no records kept, but some estimates put the world membership at 3,000,000. There are said to be about 3,000 companies in the United States, with about 300,000 members.

JEHU was a military officer of King Jehoram of Israel. In 842 B.C., at the suggestion of the prophet Elisha, Jehu conspired against his master. He drove in haste from Ramoth Gilead, where he was serving, to the capital, Jezreel. On his way he killed the king and wounded King Ahaziah of Judah. He drove his chariot over Queen Jezebel, as he entered the city. In the same fashion he murdered the entire royal family. Then he gathered together the priests of Baal who had enjoyed special privileges under Jezebel's patronage. Through a trick he succeeded in slaughtering the entire group in one building. He and his descendants held the throne for a century, thus becoming the longest-reigning dynasty in the history of Israel. W.A.I.

See also BAAL.

JEJUNUM, *jee JOO num*. See ALIMENTARY CANAL.

JELLICOE, *JEL ih koh*, **JOHN RUSHWORTH** (1859-1935), was a British naval officer and hero of World War I. Admiral Jellicoe commanded the British fleet at the Battle of Jutland in May, 1916. That fleet was the largest collection of British naval vessels which had ever gone to sea. The German home fleet was driven back into the North Sea, and did not venture into the Atlantic during the rest of the war. Historians now do not agree as to whether or not Jutland was really a great victory for the British.

Brown Bros.

John Jellicoe, commander of the British fleet during World War I

Jellicoe joined the navy when he was thirteen, and won a medal for his service in the Egyptian War in 1882. He was chief of staff to Vice Admiral Edward Seymour during the Boxer Rebellion in China in 1900. With Sir Percy Scott, he made a number of improvements in gunnery as a member of the Board of Admiralty. In 1907, he was made a rear admiral, and became commander in chief of the British Grand Fleet at the beginning of World War I.

In 1916, Jellicoe became First Sea Lord of the Admiralty. In 1918, he was made a viscount, and was appointed governor of New Zealand the next year. He was promoted to the rank of Admiral of the Fleet and given a grant of 50,000 pounds (about $250,000). Jellicoe was made an earl by King George V in 1925. C.L.L.

See also WORLD WAR I (Battle of Jutland).

JELLY AND JAM MAKING. The three common types of jelly come from fruits, starch, or animals. Gelatin is animal jelly. It is made by boiling in water the muscles, cartilage, and skins of animals. It is usually sold in stores in powdered form. Starch jellies are made from cornstarch, arrowroot, sago, and tapioca.

But jelly to most people means a fruit jelly. Certain fruits give off juice when boiled in small amounts of water. The juice is often used to make the jelly. Fruits which make the best jelly contain large amounts of a substance called *pectin*. This is one of the carbohydrate foods, and it becomes thickened in cooking. The right amount of acid in fruits is also important in jelly making.

Some fruits do not have sufficient pectin and acid for jelly. Many such fruits can be made into jelly by adding the juice of a fruit which contains much pectin, such as apples. Pectin is also made from the skins and cores of fruits used at canneries. This commercial pectin can be bought in liquid or powder form.

The best jelly fruits have much natural pectin. These include sour apples, crab apples, currants, cranberries, plums, half-ripe grapes, and quinces. Other fruits have very small amounts of pectin and acid.

Often two kinds of fruit are used, because they taste good together, or so that the pectin in one may be enough for both. Apples are often combined with grapes, strawberries, oranges, or peaches. Apricots, pears, and peaches are used with currants.

Jelly is best made in small quantities. Ripe or slightly underripe fruit should be used. The fruits must be washed, and any spoiled parts thrown out. Hard fruits, like apples and quinces, should be cut into small pieces. Berries and currants may be mashed a little.

Next the fruit is boiled. Just enough water to cover the hard fruits should be used. Even less water is needed with currants, grapes, and berries. The boiling goes on until the fruit is tender. Then the hot cooked fruit is poured into a cloth jelly bag. The bag is hung up, and the juice drips through into a bowl. The bag can be squeezed slightly with the hands when the dripping has almost stopped, but the pulp must not be pushed through the bag or the jelly will not be clear. The juice is mixed with sugar and boiled again until it "jells" or congeals. It is the pectin that makes the juice get thick. The amount of sugar used depends on the amount of pectin. The more pectin in the fruit, the more sugar may be used, and the more jelly one gets in the end. The sugar is not added until the juice starts boiling.

The juice has boiled long enough when the drops of jelly slide off the spoon in flakes or sheets. Then the jelly is poured directly into sterilized jelly glasses. When it cools it is often sealed by pouring melted paraffin over it. Or paraffin may be placed in the bottom of the glass and the jelly poured over it. As it melts in the hot jelly it rises to the top and makes a seal for the glass.

Good jelly is clear, quivers when it is unmolded on a dish, holds its shape, and leaves a smooth edge when cut.

Jams also are made by boiling fruit with sugar. The fruit is crushed and cooked, but the juice is not drained off. The fruit juice and the pulp are kept together. Jams can be made from the same fruits as jellies, and by the same methods. H.MAR.

See also PECTIN.

JELLYFISH. The jellyfishes are sea animals that contain a thick layer of a material like jelly. There are many kinds of jellyfishes. They are classed in the coelenterates, the third lowest phylum of the animal kingdom. They are not true fishes, for a fish is a vertebrate, or animal with a backbone. A jellyfish is made up only of two layers of cells. The outer layer is called the *ectoderm*, and the inner one is the *endoderm*. Higher animals have a third layer connecting these two. In place of a middle layer, jellyfishes have the thick layer of jelly. This gives them support and makes them float more easily.

American Museum of Natural History

A Jellyfish in the Medusa Stage, in which it resembles an umbrella. The tentacles trailing beneath it are able to sting severely. But some small fish are not harmed by the stings, and seek refuge from enemies among the tentacles.

There are two types of jellyfishes, the medusas and the ctenophores. A medusa looks like an umbrella, with a fringe of tentacles around the edge, and a mouth part hanging down where the handle would be. Different species vary in size from less than an inch to twelve feet. They swim by expanding like an umbrella that is opened, then pulling themselves together and squeezing out the water. The tube in the center, with its mouth, leads to the *gastrovascular cavity*. Here food is digested, and from here it is carried through branching canals to all parts of the body.

The name *medusa* comes from the tentacles, which suggest the snakes that grew on the head of Medusa, a character in Greek mythology. The tentacles usually have stinging organs. As the jellyfish floats through the water, it extends its tentacles and catches small organisms, worms, shrimps, or even small fishes. Swimmers have found that the larger jellyfishes can inflict dangerous stings.

In many coelenterates, the medusa is one stage in a life cycle. The young animal first goes through a *polyp* stage, in which it is not free to swim, but is attached. Sometimes polyps are attached together in colonies, and look like plants. When the polyp matures it breaks off from the colony and enters the medusa stage of life. Since the medusa is more active than the polyp, it has a more highly developed nervous system, and a thicker supporting layer of jelly. The existence of the same species in more than one form is called *polymorphism*.

The ctenophores are commonly called *comb jellies* and *sea walnuts*. They live in all parts of the ocean, but are most abundant in warm water. Ctenophores are jellyfishes with a different structure from most coelenterates. Some zoologists think they are a separate phylum. They are more transparent than medusas. Many are shaped like walnuts, but some are like spheres, some like ribbons, and others like thimbles. *Ctenophore* means *a comb bearer*. The animals get this name from the comblike organs that extend in bands along the body from the mouth to the opposite end. There are eight of these bands. The combs are made of groups of *cilia*, or hairlike growths. A ctenophore slowly moves through the water by moving these cilia. In some comb jellies the rapid beating gives off beautiful changing colors, and in others it gives flashes of light. R.W.MI.

See also COELENTERATE; MEDUSA.

Classification. Jellyfishes belong to the phylum *Coelenterata*. The small medusas with polyp colonies belong to the class *Hydrozoa*. Large medusas, mostly without polyps, belong to the class *Scyphozoa*. The ctenophores make up the subphylum (or phylum) *Ctenophora*.

JEMISON, MARY (1743-1833), was called the "White Woman of the Genesee." She was born at sea while her parents were coming from Ireland to America. The family settled on a farm in Pennsylvania. In 1758, the family was captured by a party of Indians and French soldiers. Most of the captives were killed, but Mary Jemison was adopted by two Seneca Indian women. She grew up with the Indians, and refused to return to her own people when she was given the chance. She married Indian men twice. Her second husband was a chief.

In 1817, the New York legislature gave her land along the Genesee River, where the white settlers became interested in her life history. In 1831, she moved with the Senecas to the Buffalo Creek Reservation, where she died. T.P.A.

JENA. See GERMANY (Cities).

JENGHIS KHAN, *JEN giz KAHN*. See GENGHIS KHAN.

JENKINS, CHARLES FRANCIS (1867-1934), invented the phantascope in 1892. The Franklin Institute recognized this as the first successful projector of life-size pictures from narrow motion-picture film. His more than 400 patents included patents for radio-photography, television, and radio motion pictures.

Jenkins was born near Dayton, Ohio, and attended Earlham College. He was always interested in invention, and in 1895 he resigned his clerkship with the United States Life Saving Service to devote all his time to invention in his laboratory in Washington, D.C. E.Y.

JENKINSON, ANTHONY. See EXPLORATION AND DISCOVERY (Table of Famous Explorers).

JENNER, EDWARD (1749-1823), was an English physician who discovered vaccination as a means of preventing smallpox. Jenner closed a gate of death. Before his time, no mother counted her children safe until all had passed through smallpox, for smallpox was an ever-

Ewing Galloway

Edward Jenner giving the first vaccination for smallpox to James Phipps in England in 1796. Sarah Nelmes (right) is bandaging her cowpox-infected hand. Jenner risked the loss of his medical reputation in attempting this vaccination.

present horror. In the 1700's alone, it destroyed sixty million human beings. If Jenner's method of vaccination were adopted everywhere, smallpox would disappear entirely from the face of the earth.

Jenner was born in Berkeley, Gloucestershire, and studied medicine at Saint George's Hospital in London. He returned to Berkeley, where he was a country doctor. His experiments started from a Gloucestershire belief that dairymaids who caught cowpox could not have smallpox. In 1796, he took matter from the hand of Sarah Nelmes, a dairymaid who had been pricked by a thorn and had become infected with cowpox while milking the cows. Jenner made two cuts on the arm of James Phipps, a healthy boy of eight, and inserted the matter from one of Sarah's sores. This was the first vaccination that had ever been performed. Smallpox matter, which would ordinarily have proved fatal, was introduced into his arm six weeks later. It had no effect because the boy had been vaccinated.

Jenner's description of his work, *Inquiry into the Causes and Effects of the Variolae Vaccinae*, was published in 1798. See also SMALLPOX; VACCINATION. V.R.

JENNER, WILLIAM, SIR (1815-1898), was an English physician whose studies of disease did much to advance medical treatment. His most noted discovery was that of the difference between typhus and typhoid fever, which made treatment of the diseases more practical.

Jenner was born at Chatham, and was educated at University College, London. He served there as a professor, and was president of the Royal College of Physicians from 1881 to 1888. Jenner was the personal physician of Queen Victoria. F.E.C.

His Works include the papers "On the Identity and Non-Identity of Typhoid Fever," and "Diphtheria, Its Symptoms and Treatment"; as well as clinical lectures and essays.

JENNET is the term used for a female ass. In Africa, jennets are often kept for their milk. See also DONKEY.

JENNEY, WILLIAM LE BARON (1832-1907), has often been called the "father of the skyscraper." He was an American architect and engineer who pioneered in what is known as *skeleton construction*. He built a number of structures in Chicago which were the first to use metal framework, the basic principle of skyscraper construction. His early Chicago structures, the Home Insurance Building (1884) and the Manhattan Building (1889), had great influence on later construction. He also improved office lighting and developed such architectural features as rapid metal elevators. Jenney's First Leiter Building (1879), and the Sears, Roebuck, and Company store building (1890) are still used in Chicago.

He was born in Fairhaven, Mass., and was educated at Lawrence Scientific School and in Paris. He served in the Union Army in the War between the States. M.C.C.

JENNINGS, SARAH (1660-1744). See MARLBOROUGH, JOHN CHURCHILL.

JENNY. See HARGREAVES, JAMES; SPINNING.

JENSON, D. H. See HELICOPTER (Helicopter Records).

JEPHTHAH was one of the "judges" of ancient Israel. He is famous for the tragic story of his sacrifice of his beloved daughter, his only child, to fulfill a rash vow. As he went out to a desperate battle with the Ammonites who were oppressing his people, he vowed that if victory were given him he would on his return sacrifice whatever first came out of the doors of his house to meet him. Not knowing this, his daughter welcomed his victorious return with songs and dances. (See Judges XI.) The story is similar to the Greek myth of the sacrifice of Iphigenia. W.A.I.

Columbia Concerts

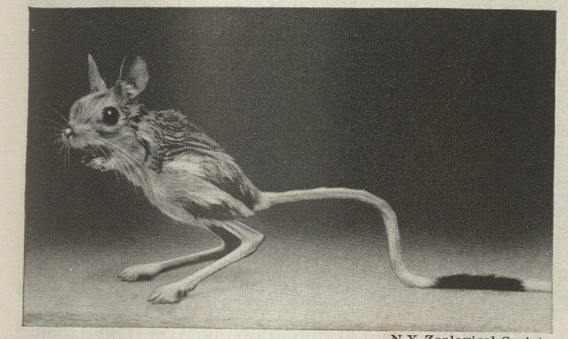
Helen Jepson, popular American opera singer

JEPSON, HELEN (1905-), is an American operatic soprano. She was born at Titusville, Pa., and grew up in Akron, Ohio. Her family was too poor to pay for her music lessons, and she worked as a shopgirl. Finally in 1923, her voice

won her a scholarship at the Curtis Institute, where she studied for five years. She sang with orchestras and on the radio, and made her debut at Philadelphia in 1931, and later appeared with the Metropolitan Opera in New York City in 1934. F.B.

JERBOA, *jer BOH ah.* The jerboa is a fawn-colored rodent or gnawing animal that looks somewhat like a tiny kangaroo. It lives on deserts and grassy plains of the Old World. The jerboa is a relative of mice and rats, and is about the size of a large rat. It can be recognized by its short forelegs and long hind ones. When the animal is frightened, it runs on its hind legs in bounding leaps like a kangaroo. When it walks it stands upright, and does not hop. Jerboas live in colonies in burrows, and come out to hunt food at night. In cold climates they sleep through the winter.

The best-known species is the *Egyptian jerboa.* This animal is six to eight inches long. Its tail is even longer and has a tuft on the end. The short forelegs, with five toes, are used chiefly to handle things. The hind legs have three toes. The Egyptian jerboa can be tamed and



N.Y. Zoological Society

The Jerboa Looks Like a Tiny Kangaroo, but it is really a member of the rodent family. Like the kangaroo it jumps when frightened, and it uses its long tail to balance itself.

makes a delightful pet. Another well-known species is the large *alactaga* of Turkestan. The natives kill this animal for food. An American cousin of the jerboa is the small *deer mouse*, or *jumping mouse.* S.P.Y.

See also DEER MOUSE.

Classification. Jerboas belong to the family *Dipodidae.* The Egyptian jerboa is *Dipus aegypticus.* The alactaga is *Alactaga decumana.*

JEREMIAH was a Hebrew prophet during the last years of the kingdom of Judah. He was the son of Hilkiah, a priest in the village of Anathoth, north of Jerusalem. Jeremiah began to prophesy in 626 B.C., while still a very young man. He worked for over forty years. He foresaw the Babylonian invasion and disaster to Jerusalem. In vain he tried to reform his people's social and political ideas. Jerusalem was reduced to ruins and its inhabitants carried away as captives. Jeremiah was in prison when the city fell. The Babylonian conqueror, Nebuchadnezzar, gave him the choice of going with the captives to Babylonia or staying with the few Jews left in Palestine. Jeremiah chose to remain.

He was safe in Jerusalem until Gedaliah, who had been appointed governor by the Babylonians, was murdered. Then a group of Jews fled to Egypt and forced the prophet to go with them. There we catch our last glimpse of him, still trying unsuccessfully to correct the evils of his people's ways. The gentle Jeremiah's bravery, loyalty, and spiritual dignity make him one of the greatest souls of ancient Israel.

The Prophet Jeremiah, from a famous painting by Michelangelo

The Book of Jeremiah is the second of the Great Prophets, as most Bibles are arranged. Chapters 1-24 are mainly prophecies of Jeremiah. Many are in poetry. Chapters 25-44 are in prose and relate the experiences of the prophet. The rest of the book contains many declarations about foreign nations. Their author is not definitely known. The story of Jeremiah's work is thought by some to have been written by Baruch, the prophet's friend and secretary. The poems of Jeremiah have a thoughtful but haunting beauty. Some are very powerful, such as those dealing with "the foe from the north." A famous feature of the book is Jeremiah's "confessions." These passages portray his thoughts and feelings under his seeming failure. W.A.I.

JERICHO. See PALESTINE (Cities).

JERICHO ROSE. See RESURRECTION PLANT.

JERITZA, *YEH riht sah,* **MARIA** (1887?-), is a dramatic soprano. She had a brilliant operatic career, first in Vienna, then with the Metropolitan Opera Company in New York City. She was born in Brünn, Austria, and studied music at the conservatory there. In 1913 she became a member of the Vienna Court Opera. Maria Jeritza made her American debut in New York City in 1921, in the first American performance of Korngold's *The Dead City.* Her autobiography, *Sunlight and Shadows*, was published in 1924. F.B.

JERKIN, *JUR kin.* See DRESS (The 1600's).

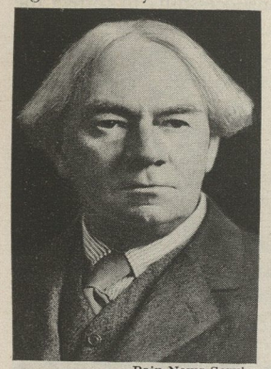
JERKING. See DEER.

JEROBOAM was the name of two characters in the Old Testament.

Jeroboam I, before he became king, had been foreman of a gang of workers under Solomon. But he was suspected of treason and was compelled to flee to Egypt for safety. When Rehoboam came to the throne in 931 B.C., he returned to Israel. He was soon accepted as king by the revolting tribes of northern Israel. His rule of slightly more than twenty-one years was uneventful except for strained relations with Judah. He is most famous for his religious policy. He established two royal shrines, at Dan in the far north and at Bethel at the extreme south of his kingdom, in rivalry of the temple in Jerusalem. He followed older practices of setting up an image of a bull in each shrine. As a ruler, he was little more than a rural leader. The people had turned against the pomp and expense of Solomon's court.

Jeroboam II was the fourth monarch of the dynasty of Jehu upon the throne of north Israel. He ruled from 793-753 B.C. The reign of Jeroboam was a time of expansion, and of prosperity such as had not been known since the days of Solomon. But with this came great social corruption, and exploitation of the lower classes. This was the condition which called forth such great social

prophets as Amos and Hosea, of the latter half of the eighth century B.C. W.A.I.



Bain News Service

Jerome Klapka Jerome, English author and humorist

JEROME, JEROME KLAPKA (1859-1927), was an English author and humorist. He wrote *Idle Thoughts of an Idle Fellow; Three Men in a Boat;* and the serious play, *The Passing of the Third Floor Back.* Jerome was born at Walsall in Staffordshire. See also BARR, ROBERT. G.E.B.

JEROME, SAINT (about 340-420), was a learned Father of the Roman Catholic Church. He was born at Stridon, a small town of the Illyrian Alps. From 374 to 379 he led a hermit's life in the desert of Chalcis near Antioch. Jerome was then ordained a priest in Antioch, and went to Constantinople. There he became a student and friend of Gregory of Nazianus, and began intensive study of the Scriptures. In 382 he returned to Rome. On the death of Pope Damasus I, Jerome was forced to leave the city. His harsh criticisms had made him many bitter enemies. He settled in a monastery near Bethlehem in 386, as a recluse and a student.

The Biblical knowledge of Jerome made him the best of the early interpreters of the Bible. His Latin version of the Old Testament from the Hebrew is the Vulgate version which is in use among Roman Catholics today. The Latin New Testament was revised by him, using the best Greek manuscripts of his time. His feast day is September 30. F.J.S.

See also BIBLE; VULGATE.

U&U

Saint Jerome was one of the great Bible students of the Roman Catholic Church, as well as a writer and historian. This photograph is reproduced from a painting by Albrecht Dürer.

JEROME OF PRAGUE (1360?-1416) paid with his life for his fight for religious reform. He studied at Oxford, and became converted to the teachings of Wycliffe, the English reformer. On his return to Prague, he became the companion and supporter of John Huss. Together, the two men preached against the shortcomings of the Church and the corruptness of the clergy. Huss was put into prison in 1415. Jerome tried to defend him, but was also arrested. He was tortured, and finally agreed to change his opinions. But he later again attacked the Church, and was burned at the stake on May 30, 1416. His ashes were thrown into the River Rhine. See also HUSS, JOHN. W.W.S.

JERROLD, DOUGLAS WILLIAM (1803-1857), was an English writer of dramas, essays, and humor. He is remembered chiefly for his humorous sketches, *Mrs. Caudle's Curtain Lectures,* and for his play, *Black-eyed Susan.* This play was produced in London in 1829, and ran for 300 nights. Jerrold was born in London. B.M.

JERSEY. See CATTLE (Dairy Cattle).

JERSEY, *JUR zih,* is the largest of the Channel Islands. It is the southernmost island of the group and lies off the west coast of the Normandy peninsula in the British Channel. Jersey has an area of about 45 square miles and a population of about 57,000.

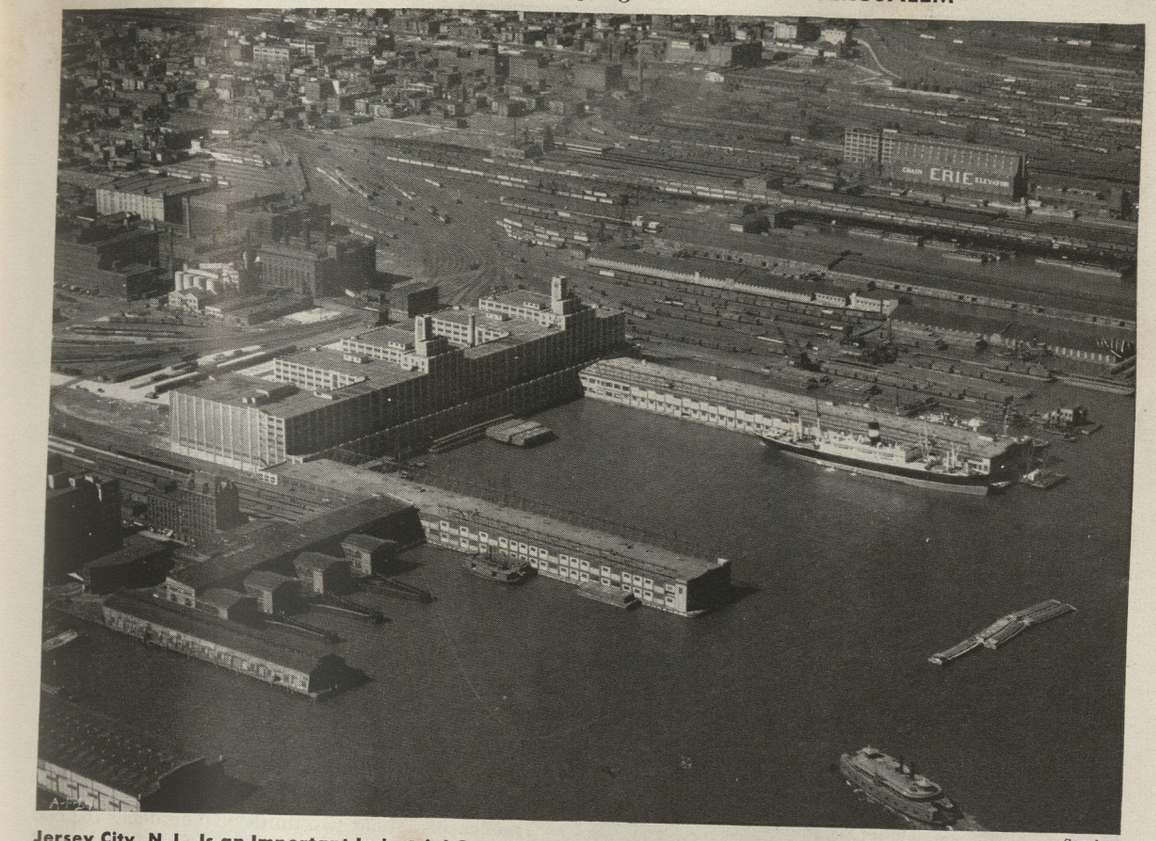
It is known as the original home of Jersey cattle. Important products are potatoes, tomatoes, and turnips. Jersey has its own legislature, the Assembly of the States. The chief executive is a lieutenant governor appointed by the British king. Most of the people speak English, but French is the official language. Jersey was occupied by the Germans in World War II. R.PEA.

JERSEY CITY, N.J. (population 299,017). This slaughtering and meat-packing center provides almost all the meat for New York City, which is directly across the Hudson River. Jersey City is also an important manufacturing center, and a shipping and receiving port. The slogan of Jersey City boasts that it has "Everything for Industry." Transatlantic and Atlantic Coast steamers dock at the city's east waterfront wharves. Freight ferries constantly cross the Hudson River between Jersey City and New York City.

Several tunnels under the Hudson River provide passage for the automobile, subway, and railroad traffic between Jersey City and New York City. The double-tube Holland tunnel, completed in 1927, allows about four thousand automobiles to pass between the two cities every hour. The Pulaski skyway, a three and one-half mile steel and concrete viaduct, connects Jersey City with Newark, N.J. More than thirty thousand autos use this viaduct every day. Nine railroad lines serve Jersey City. See NEW JERSEY (inset on colored map).

St. Peter's College, a state teachers' college, and a state dental college are located in Jersey City. The city also has a medical center which is nationally famous for its size and equipment.

The first buildings of Jersey City were erected in 1633. The city was laid out and incorporated in 1804 as Paulus Hook. In 1820 and 1838, it was reincorporated as Jersey City. The towns of Bergen and Hudson were made a part of Jersey City in 1869, and Greenville was added in 1873. The city has a commission form of government. It is the county seat of Hudson County. R.W.HAT.



Sawders

Jersey City, N.J., Is an Important Industrial Center and seaport just across the Hudson River from New York City. The large building in the foreground is the terminal warehouse of the Pennsylvania Railroad. In the background is a similar terminal of the Erie Railroad. In the lower right-hand corner is one of the many ferryboats that carry passengers and vehicles between Jersey City and New York. Several tunnels under the Hudson River also serve to connect the two cities.

JERSEY CLOTH is a plain knitted cloth of wool, rayon, cotton, silk, or a mixture of these yarns. The cloth may be smooth or somewhat hairy, or *napped.* Rayon jersey is usually called *tricot.* Jersey is used for dresses, suits, and sportswear. Stockinette, a kind of cotton jersey, is used for infants' wear. G.G.DE.

JERUSALEM, *juh ROO sah lem* (population 164,440), in Palestine, is a holy city of Jews, Christians, and Moslems. The Jews of Bible times made Jerusalem their capital and chief city and built their sacred Temple there. The early Christians considered Jerusalem holy because it was the site of the crucifixion and of many happenings in the life of Jesus. The Moslems made Jerusalem their third holy city, ranking it next after the Moslem holy cities of Mecca and Medina.

People of these three faiths, with their many sects, live in Jerusalem today. Pilgrims from all parts of the world throng the city. Modern Jerusalem is a city of strange contrasts. The world of telephones, radios, and air-conditioned apartments exists side by side with a world of narrow alleys and veiled women. Here the West, with its new ideas and modern machines, meets the philosophical and religious world of the Orient. Here, too, the world of Solomon, Jesus, and Mohammed meets the modern world of conflicts between Jews and Moslems. These conflicts echo the stormy history of Jerusalem.

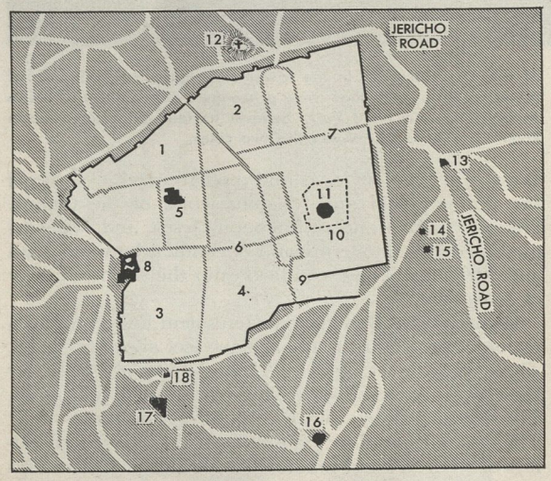
Location and Description. Jerusalem lies on top of a region of broken hills, about 2,500 feet above sea level. There is no level land for almost thirty miles. Below the city on the west is the Mediterranean coastal plain. The Jordan Valley and the Dead Sea lie on the east. The city is located in the fork formed by the small valleys of Kedron and Hinnom. The Mount of Olives rises east of Jerusalem and gives a good view of the city. Jerusalem has no geographical advantages. It does not lie on any major trade routes. But the city became important for political and military reasons.

Jerusalem is really two cities. Old Jerusalem, still surrounded by its ancient wall, is divided into four sections, which are inhabited by Moslems, Jews, Christians, and Armenian Christians. This old walled city is a network of winding alleys, many of which are built in steps. The streets are overhung by arches, and lined with the high walls of houses. Here are found ruins, Moslem churches,

Fritz Henle

At the Ancient Wailing Wall, or Wall of Tears, Jews of Jerusalem gather to weep and tell their sorrows. Arabs were also given the right to use the Wailing Wall after a serious riot in 1929 between the Jews and the Arabs.

Jewish synagogues, Christian convents, market places, and slums. Outside the walled city are the suburbs, which take up three times as much space as Old Jerusalem. Chief among these suburbs is the new Jewish business district, with its modern office buildings, shops, and wide, well-paved streets.



A Map of Ancient Jerusalem

(1) Christian quarter
(2) Moslem quarter
(3) Armenian quarter
(4) Jewish quarter
(5) Church of the Holy Sepulcher
(6) Street of David
(7) Via Dolorosa
(8) Citadel
(9) Wailing Wall
(10) Dome of the Rock
(11) Site of Ancient Temple
(12) Calvary
(13) Gethsemane
(14) Tomb of Absalom
(15) Tombs of Saint James and of Zechariah
(16) Pool of Siloam
(17) Tomb of David
(18) House of Caiaphas

The People. About two thirds of Jerusalem's 164,000 people are Jews. The rest are chiefly Moslems and Christians. New life poured into Jerusalem with the Jewish immigrations which took place between World Wars I and II and after.

Twenty-nine different languages are spoken in the city. The visitor notices startling contrasts among the people he sees on the streets. American women dressed in the latest fashion walk along sidewalks where Arabs stride in loose, flowing robes. Jerusalem is not an industrial city. Crowds of pilgrims and travelers are the chief source of income for the people of Jerusalem.

Religious and Cultural Institutions. The oldest churches and religious shrines are in Old Jerusalem. The Christian Church of the Holy Sepulchre is shared by many Christian sects. Many persons believe that it is built over Calvary, or Golgotha, the traditional site of the crucifixion of Jesus. One of the holiest and most beautiful of Moslem churches is the eight-sided Mosque of Omar, built over a huge rock which was probably a place of sacrifice in early times. This stone was known as the Dome of the Rock. The Mosque stands where Solomon's Temple once stood. The Wailing Wall, where orthodox Jews gather to lament the passing of their early days of glory, still remains. It is believed to be a part of the Temple.

In the suburbs, too, there are many churches, monasteries, and other religious institutions. The Hebrew National University, an impressive group of buildings,

Fritz Henle

The Great Mosque of Omar in Jerusalem stands on ground once occupied by an ancient Jewish temple. Jerusalem is a shrine not only to Christians but also to a great number of Jews and Moslems. It has many churches of each faith.

is located on the Mount of Olives. It has the best library in the Near East. Near the university is a large hospital, also Jewish, which has the most modern equipment and is an important center of medical research. Another fine building is the Y.M.C.A., which was put up largely with Rockefeller funds. John D. Rockefeller, Jr., provided money for the Museum of Antiquities, which contains collections made by archaeologists.

Water Supply. Like most hilltop cities, Jerusalem has found it hard to get enough water. But a good water system has been built. Pipes and pumps bring up water from the coastal plain, and reservoirs store the water.

Communication. Railroads connect Jerusalem with all the chief cities of Palestine. Jerusalem is connected by railroad with the outside world through Damascus and Cairo.

History. Stone tablets which were recently discovered in Egypt carry the known history of Jerusalem back to a time 1,400 years before the birth of Christ. These tablets refer to the city as *Ursalimmu*, which means *city of peace*. This is not a very suitable name for Jerusalem, for it has been destroyed twenty times. In the struggle for Jerusalem, religious feelings, business motives, and political ambitions have always been important.

Jerusalem was captured about 1000 B.C. by the Hebrew King David. The Jewish conqueror fortified the walls and built a palace. He selected the site for the temple which was later built by Solomon, his son. Solomon's Temple was a tremendous structure, with a central temple to honor the Jewish God Yahweh, called Jehovah in the Bible. Solomon enlarged the palace and the city.

When Solomon died, the Hebrew nation was split into the two kingdoms of Israel and Judah. Jerusalem was the capital of Judah. In 586 B.C. it was captured by King Nebuchadnezzar of Babylonia, and Solomon's Temple was destroyed. Many of the Jews were taken to Babylonia as captives. They did not return until the reign of Cyrus of Persia. During their captivity they had looked back on Jerusalem and its Temple as symbols of their former glory.

The second Temple, built by the Jews when they returned to Jerusalem, was not quite so grand as the first. In 332 B.C., Jerusalem fell under the rule of the Macedonian king, Alexander the Great. Later, it was ruled by the Ptolemies, kings of Egypt. In 168 B.C., the city was destroyed by Antiochus of Syria. The Jews rebuilt the city under the leadership of the Maccabees.

Jerusalem remained prosperous until it was conquered by the Romans in 63 B.C. The Romans set Herod up as king, and he ordered the Temple rebuilt. This was the Third Temple, and the last. Shortly after the death of Jesus, the Jews revolted against Roman rule. The Temple and the city were destroyed by Roman troops in A.D.70, by order of the Roman Emperor Titus. The destruction of the Temple is regarded by Jews as a symbol of their sufferings. The third Temple existed in the time of Jesus, and is mentioned in the story of the money-changers. What is believed to be part of its foundation still remains, and is called the Wailing Wall, or the Wall of Tears.

After Jerusalem was destroyed by the Romans, the city was rebuilt by the Roman Emperor Hadrian. He renamed the city Aelia Capitolina, and forbade the Jews to enter it. His successor, Constantine, became a Christian and made Jerusalem into a Christian shrine, giving it its old name once more. Constantine ordered the building of the Church of the Holy Sepulcher.

In 615 Jerusalem was sacked by the Persians, and in 636 it was conquered by the Moslems under the Caliph Omar. It was at this time the famous Moslem Mosque of Omar was built on the site of the ancient Temple. Jerusalem remained under Islamic rule for the next thirteen hundred years, except for the periods from 1099 to 1187 and 1229 to 1244, when the Christian Crusaders held it.

In World War I, the British took the city for military reasons. British troops under General Allenby forced the Turkish troops to withdraw. The British were careful not to injure the city by gunfire.

Jerusalem became the center of British rule in 1922 when the League of Nations gave Great Britain a mandate over Palestine. The city was often the scene of violence on the part of Jews and Moslems. The Moslem Arabs objected to admitting Jews to Palestine.

After World War II, many Jews from Central Europe migrated to Jerusalem and the old conflicts flared up again. Terrorism again reigned in Jerusalem. In 1946 the King David Hotel was wrecked by bombs and about 100 persons were killed in the explosion. The Holy City became a major battlefield in 1948 when war broke out over the partition of Palestine. The United Nations drafted plans for making Jerusalem an international city under United Nations control. The forces of King Abdullah of Jordan held part of Jerusalem, and the Israelis occupied the rest of the city. Both sides opposed internationalization. R.PEA.

Related Subjects. The reader is also referred to:

Constantine I	Maccabees
Crusades	Nebuchadnezzar
Cyrus the Great	Olives, Mount of
David	Palestine
Gethsemane	Solomon
Jesus Christ	Temple
Jew	Zionism
Judea	

JERUSALEM ARTICHOKE. See ARTICHOKE.

JESSAMINE, *JESS ah min.* See FLOWER (color plate, Woodland Flowers [Carolina Jessamine]); GELSEMIUM; JASMINE.

JESSE. See DAVID.

JESTER was a person whose duty it was to amuse the family of a king or nobleman. The jester was sometimes also called the *court fool*. He performed antics very much like those of the modern clown. Watching him, a king might easily forget the troubles of his kingdom. The jester wore a checkered costume of many colors. From his close-fitting cap, and sometimes from his long, pointed shoes, dangled bells which tinkled as he danced about.

It is not known when jesters first appeared. There may have been jesters in Britain during the time of the Saxons. We do know, however, that licenses were issued to jesters in the 1600's. Before that, a history of William the Conqueror (who lived in the 1000's) names the ruler's court fool, Goles. Many kings who followed William had jesters. Henry VIII's jester, Will Somers, was a gift from Cardinal Wolsey. The famous painter Holbein made a portrait of Saint Thomas More's jester. And in 1728

Jonathan Swift wrote an epitaph on the Earl of Suffolk's fool, who was buried in Berkeley churchyard.

The court jester enjoyed an unusual position with his employers. He was almost a member of the family, taking part in private gatherings, sharing family secrets, and playing with the children. It is easy to understand

A Court Jester in Cap and Bells

how Shakespeare's Hamlet felt when the skull of his father's jester, Yorick, was uncovered by gravediggers. Hamlet describes him as "a fellow of infinite jest, of most excellent fancy." Besides Yorick, Shakespeare made famous another jester, in his play *King Lear*. To be funny, most jesters had to be clever, and some are believed to have given their kings advice. G.HUG.

See SHAKESPEARE, WILLIAM.

JESUIT, *JEZ yu it*, is a member of a Roman Catholic religious order of men, called the Society of Jesus. It was founded in 1534 by Ignatius Loyola (see LOYOLA, SAINT IGNATIUS), and approved by Pope Paul III in 1540. The members take vows of poverty, chastity, and obedience. They must also submit entirely to the call of the Pope for any undertaking he may propose to them, and are forbidden to fill any of the higher offices of the Church. A few Jesuits have been made cardinals and archbishops, but only at the command of the Pope. Except for slight changes, the constitution of the order as drawn by the founder is still in force. In general, the organization aims to work for the glory of God, to defend the Roman Catholic faith against heresy, to engage in missionary work, and to educate the young.

Divisions of the Order. The general and higher officials of the society are chosen from the *professed fathers*, or priests with full vows. The *helpers*, or *coadjutors*, include the lay brothers who perform the minor duties of the institutions. Those who are preparing to become priests are known as the *students*, or *scholastics*, and those who are undergoing probation to enter the order are called *novices*. Supreme authority rests with the *father general* in Rome, who is elected for life.

Early Development. Soon after its founding the order quickly spread through Europe. It became the strongest of the forces opposing the Protestants, and was closely associated with the Counter Reformation. (See COUNTER REFORMATION.) But the Catholic heads of many European countries opposed the Jesuits. In 1773, Pope Clement XIV yielded to their pressure. He suppressed the order in all countries except Russia, and, to a lesser extent, Prussia. But the Jesuits were too well remembered to suffer more than a temporary check. In 1801 Pope Pius VII revived the order in part, and in 1814 it was restored to its former position.

Educational Work. The Jesuits have been generally regarded as the leading and most scholarly of Catholic educators. They have established numerous schools and colleges wherever they went. They developed original and highly successful methods of teaching the classics. Their scientific courses achieved high standards of quality. For example, such great astronomers of the 1800's as De Vico, Perry, and Secchi were Jesuits. In the field of education, the society reached its height about 1750. At that time it controlled 728 colleges, with about 300,000 students. It now has about 220 colleges throughout the world. In the United States it has a large number of educational institutions, including Georgetown, Fordham, and Saint Louis universities, Boston College, and the College of the Holy Cross.

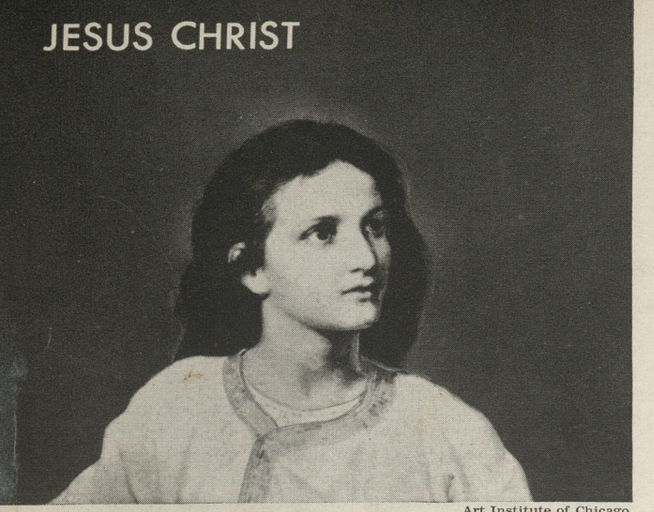
Missionary Work. The society has always been one of the most active of missionary groups. The members have often faced danger and made sacrifices to spread their religious beliefs. Saint Francis Xavier, the friend and companion of Ignatius, made many converts in remote parts of India and Japan. At a later period, a band of Jesuits made their way into the heart of China, and also entered other nations. In America, Fathers Garnier, Jogues, Lallemant, and others died as martyrs in the course of their work. Father Marquette, who explored the Mississippi region, endured sufferings and hardships during this work with the Illinois Indians of the Mississippi Valley. Father François Charlevoix explored the French colonies in America, and for twenty-two years was editor of a historical and scientific journal.

The Jesuits have often been seriously attacked for their activities. Yet in spite of this, they have contributed effectively to the work of the Catholic Church throughout the world. They numbered about 22,000 at the time of their suppression. The total for the world is now about 28,000. Of these, about 6,000 are in the United States and about 1,000 are in Canada. Approximately 600 American Jesuits are on foreign missions throughout the world. About 4,000 Jesuits from all countries are on foreign missions. F.J.S.

See also DE SMET, PIERRE JEAN.

JESUITS' BARK. See CINCHONA; QUININE.

JESUS CHRIST



Art Institute of Chicago

JESUS CHRIST was the founder of the Christian religion. Christians believe He is the Son of God, who was sent to earth to save mankind. Even people who are not Christians believe he was a great and wise teacher. He has influenced humanity more than any one else who ever lived.

Even in those countries where few of the people are Christians, His influence has been very great. Every time a Christian writes a date, he is remembering Jesus. The calendar most widely used is based on the date of His birth.

Biographies. All we really know about the life of Jesus is to be found in five short books. These are the first books in the New Testament—the Gospels of Matthew, Mark, Luke, John, and The Acts. The many books written about Jesus are based on these gospels.

Matthew and John were two of Jesus' disciples. They knew Him and worked with Him during the last few years of his life. John was His most beloved friend. Mark and Luke may not have known Jesus personally, but they knew men who had known Him. The four writers were men of different kinds, and they wrote about Jesus in different ways. But the basic facts of their stories about Him are the same.

Early Years. In all Christian countries, calendars are dated from what was supposed to be the year of Christ's birth. But when the calendar was first set up a mistake was made in the date of Jesus' birth. Scholars now believe that Jesus was born in either 4 B.C. or 6 B.C. The mother of Jesus was the Virgin Mary, espoused to Joseph of Nazareth, a carpenter. The birth of Jesus was announced to Mary by the angel Gabriel, who told her that her son was the Son of God, the promised *Messiah* of the Jews. Mary was told that her Son's name would be Jesus, which means *help* (*of the Lord*), or *Savior*.

Shortly before the birth of Jesus, Mary and Joseph went to Bethlehem to pay their taxes. Bethlehem was a small town in southern Judea. Mary and Joseph found that Bethlehem was crowded, and they had to take a room in a stable. There Jesus was born, and Mary made a cradle for Him in a manger. No one is sure on what exact day of the year Jesus was born, but since the 300's, December 25 has been celebrated as the birthday of Christ, or Christmas.

The Gospels tell of wonderful things which happened at the time of Jesus' birth. Shepherds near Bethlehem saw angels in the sky and heard them sing, "On earth peace, good will toward men. For unto you is born this day, in the city of David, a Savior, who is Christ the Lord." They found the infant Christ in the stable and worshiped Him.

Eight days after Jesus' birth, He was circumcised in accordance with Hebrew law. When He was a month old, Mary and Joseph presented Him at the Temple in Jerusalem. But soon trouble came. Wise men of the Orient had come to find the new-born Messiah. They had stopped first in their search at the court of Herod, who then ruled Palestine. Later they found Jesus by following the light of a star which guided them; and they gave Him gifts of gold, frankincense, and myrrh. They had promised to return to Herod after they found the Christ Child, but they did not do so. When they first told Herod of Jesus, he became jealous of his rival, the "King of the Jews," and ordered that all newborn boys near Bethlehem be killed. Joseph had been warned of the danger in a dream, and the family fled to Egypt. Herod died a few months later, and the family returned to Nazareth. Here Jesus grew to manhood.

Little is known about the childhood of Jesus. Luke tells of one incident: when Jesus was twelve, He went to the Temple in Jerusalem for the Feast of the Passover. There He amazed the Temple wise men with His knowledge of the things of the spirit. Except for this and the remark by Luke that "the child grew and waxed strong, filled with wisdom, and the Grace of God was

Metropolitan Museum of Art

The Christ Child Was Born in a Manger in the town of Bethlehem, Judea. This famous painting by the Flemish artist Gerard David shows angels hovering in the stable. Another angel is flying over the fields telling shepherds that the Redeemer has been born. From the heavens pealed a chorus of heavenly voices, singing "Glory to God in the highest, and on earth, peace, good will toward men."

Art Institute of Chicago

The Child Jesus Debating with the Jewish Teachers in the Temple. The Holy Family visited Jerusalem to celebrate the Feast of the Passover. While returning home, they found Jesus was not with the caravan. They hastened back to the city and found their son discussing religion with learned elders of the Jewish Church. All who listened were amazed by the knowledge and answers given by the 12-year-old youth. When his parents complained of the worry they had suffered, Jesus answered, "How is it that ye sought me? Wist ye not that I must be about my Father's business?" This famous painting is by Veronese.

upon Him," we know nothing of Jesus' life until He was thirty. Probably He helped Joseph as a carpenter.

His Early Ministry. When He was about thirty years old, there came a change in His life. He knew that He was different from other men, and that He had a special mission in life to carry out. His cousin, John the Baptist, the "voice of one crying out in the wilderness," had prepared the way for Him with his preaching. Jesus went to John to be baptized. John recognized Him as the Messiah, and told the people who He was.

Jesus then went into the wilderness to prepare for His missions. The devil tempted him to use His powers as the Son of God to become a great king and to rule the world as a king. But He knew that He must live as a teacher of His people. When He returned to the towns, John the Baptist pointed Him out to some of his followers as the Messiah. These men became Jesus' first disciples. The first four disciples were Peter, Andrew, James, and John. Later Christ picked eight more men to help Him carry out His work.

From the beginning of His ministry, Christ showed a love for all men. His first public appearance was at a wedding feast in Cana. Here He performed His first miracle. He turned water into wine when His host ran short of wine.

Jesus did not hesitate to tell the people who He was. On His first visit to His home at Nazareth, He entered the synagogue and announced that He was the Messiah. When he went to Jerusalem for the Feast of the Passover, He announced Himself in the Temple. He also cleansed the Temple by driving out the merchants and money-changers who were using it for their business.

The people of Jerusalem were impressed by many of the things Jesus had to say while He was there for the festival. But Jesus left Jerusalem for Galilee, which He had chosen as the place for His ministry to begin. On His trip to Galilee, He passed through Sychar in Samaria. There He held His famous conversation with the woman at the well. In Galilee, He chose the town of Capernaum as His headquarters. From there, He went about the country teaching and preaching. His word spread rapidly among the people of Palestine, and soon He became widely known.

Second Year's Ministry. The Gospels tell in detail the story of Jesus' ministry. There were several very important events during the middle period. One of these was the *Sermon on the Mount*. This was a sermon in which He told about His basic beliefs and teachings. Some people have called this sermon the "constitution of the Kingdom of Heaven." All the important moral principles of the Christian religion can be found in it. It included the Beatitudes, or verses beginning "Blessed."

Another important event during this time was the occasion when a woman anointed His feet with oil. At this time, He told His followers He had the right to forgive sin. He gained many converts with the miracles He performed, and He used such occasions to emphasize various points in His teachings. He also gave to His disciples the power to perform miracles, and they went about the land preaching in His name.

Shortly before the end of the second year of His ministry, Jesus told His disciples that He must "suffer many things . . . and be killed." He felt that if His teachings were to be fully understood and His ministry completed, He must die to save all men. His disciples did not fully understand the reasons behind Jesus' thinking. But

Art Institute of Chicago

Christ's Agony in the Garden of Gethsemane painted by the artist, El Greco. Jesus was accompanied by His apostles Peter, James, and John, who are shown sleeping on the left. On the right are soldiers led by the traitor Judas. Christ appealed to His Heavenly Father saying, "If Thou be willing, remove this cup from Me; nevertheless not My will, but Thine, be done." Then an angel appeared to strengthen Christ for the torture and death ahead.

Luke wrote, "He steadfastly set His face to go to Jerusalem." The journey was a slow one with many stops along the way. But Jesus never drew back from what He knew was certain death.

The Last Months. On the way to Jerusalem, many of the most important events in Jesus' career occurred. Among these were the Transfiguration, the healing of the man born blind, and the raising of Lazarus from the dead. In these days, also, Jesus gave some of His most important sermons and told some of His best parables.

But trouble was stirring for Him in Jerusalem. As Jesus taught, His popularity with the common people grew. But many of them misunderstood Him. They believed that He was going to lead a revolution against the Romans, and set up an independent Jewish kingdom again. But the people were also impressed by His religious teachings.

As His popularity grew, the leaders of the Jewish religion began to hate Him. They were jealous of His popularity. They were angered by His outspoken dislike of hypocrisy in the midst of ceremony and ritual. They sneered at His claim to the right to forgive sins. One of the leading groups, the Pharisees, were His particular enemies. He openly criticized them as hypocrites. The church leaders determined that Jesus must die, and His power end.

Jesus at last came to Jerusalem for Passover Week. On Sunday, He made a triumphal entry into the city. He was cheered by the common people, who covered His path with branches of palm trees. He spent part of His time during the next few days in the city, and once again cleansed the Temple. The rest of the time He spent at Bethany, where He meditated and prayed. Thursday night He was with His disciples in Jerusalem to celebrate the Feast of the Passover. This was the Last Supper, which is the source of the Christian Eucharist. The Christian Communion Service is still held in honor of this Feast.

Later on Thursday night He climbed the Mount of Olives above Jerusalem to the Garden of Gethsemane.

Painting by Veronese; Art Institute of Chicago

The Centurion Pleads with Christ to heal his servant who is paralyzed. Christ said "I will come." The centurion replied, "I am not worthy that Thou shouldest come under my roof; but speak the word only and my servant shall be healed."

Painting by Hoffman; Art Institute of Chicago

The Scribes and Pharisees Tested Jesus by bringing in a sinful woman and asking if she should be stoned in accordance with Moses' Law. Christ answered by writing "He that is without sin among you, let him first cast a stone at her."

Art Institute of Chicago

Judas Iscariot Betraying Christ with a Kiss after the Agony in the Garden. Judas was given thirty pieces of silver for identifying his Master with a kiss. Clustered about Jesus, carrying clubs and torches, are the high priests and elders. The noted Italian artist Giotto di Bondone shows Peter (left) cutting off the ear of Malchus with a knife.

Here He prayed, knowing He was facing the greatest crisis in His life. Later that night He was arrested by men sent by the priests and Pharisees. Judas, one of His disciples, pointed Him out. Judas had betrayed his master for thirty pieces of silver. Later, he hanged himself.

After Jesus' arrest, events moved swiftly. He was taken before Annas, a former high priest of the Jews. After Annas had questioned Him, He was put on trial before the Sanhedrin, the high Jewish court.

The Sanhedrin at first had difficulty in making a case against Him because they had no witnesses. But the high priest finally asked Him if He was the Son of God. Jesus said He was. With this statement, the Sanhedrin found Him guilty of blasphemy and sentenced Him to death. Palestine was a Roman colony, and it was necessary for the Roman governor, Pontius Pilate, to approve all sentences of death. Jesus was taken to Pilate.

According to some accounts, Pilate was a kindly man. But his policy of governing Judea was to let the Jews run the country so long as they did not hurt the Romans' interest. He did not want to interfere in the case of Jesus, but made some attempt to save Him without cost to himself. He took Jesus and Barabbas, a condemned murderer, out on the steps of his palace, and told the crowd to pick one of them to go free. The crowd, which five days before had welcomed Jesus in Jerusalem, was influenced by the clamor of His enemies in their midst, and they picked Barabbas to go free. Jesus was turned over to the soldiers to be executed. They spat on Him, and placed a crown of thorns on His head to mock Him.

He was made to carry a heavy wooden cross up the road to the top of Mount Calvary, outside Jerusalem. There He was nailed to the cross, which was set up between the crosses of two thieves. After several hours, He died. Before He died, He said, "Father, forgive them, for they know not what they do." His mother Mary and some of His disciples wept at the foot of the cross. After His death, His body was taken down and placed in a cave by Joseph of Arimathea and Nicodemus. The next two days were days of sadness for His disciples and other followers. But on the morning of Sunday, Mary

Magdalene found the stone rolled away from the tomb. Inside, she found the body of Jesus was gone. And two Angels appeared who told her, "He is risen!"

Jesus remained on earth for forty days after His resurrection. He met several times with His disciples and other followers and gave them His final instructions. At the end, they were permitted to see Him rise up to Heaven.

Metropolitan Museum of Art

The Crucifixion of the Savior, carved in ivory during the 1300's. Mary Magdalene and a friend are supporting Mary, who is overcome with grief by the death of her beloved Son. When Christ died on the Cross, the Temple curtain is said to have ripped in two, the earth quaked, and rocks split. Tombs opened, and the dead appeared in the city. A frightened centurion cried, "Truly this was the Son of God."

The Christian faith was spread by the disciples and by men who heard of Jesus from them. It was many years before the Church came into being.

Jesus has influenced other religions as well. Although the Jews rejected him as their Messiah, many of His teachings are still part of the Jewish religion, as they were when He was on earth. Jesus is also one of the prophets of the Moslems. A.R.Ble. and F.J.S.

Related Subjects. The reader is also referred to:

Apostle
Christmas
Cross
Good Friday
Gospels
Herod (the Great)
John the Baptist
Joseph of Arimathea
Mary Magdalene
Mary of Bethany
Messiah
Nazareth
Olives, Mount of
Pentecost
Pharisee
Pilate, Pontius
Resurrection
Sanhedrin
Transfiguration
Virgin Mary

JET. Near Whitby, in Yorkshire County in England, a compact variety of coal is found that is so hard and uniform that it can be carved into almost any form and polished so highly that it resembles black glass. This substance is generally known as *jet*. The largest deposits of jet are those in Yorkshire, but jet is also found in various places in Germany, France, and Spain. The mineral was used for making buttons and dress ornaments. It was known to the Greeks and the Romans. The Greeks even used powdered jet as a remedy for toothache. F.H.P.

JET PROPULSION is a principle used to drive aircraft and missiles. It has brought about a dramatic revolution in flying. Planes without propellers can knife through the sky faster than sound travels through the air. Pilotless missiles, spouting flame and smoke, are driven hundreds of miles above the earth.

Jet-propelled aircraft are among the newest of man's inventions. Yet the first simple jet engine was invented more than 2,000 years ago. It took all the years between then and now for men to learn how to put jet power to use. Scientists believe that in the future jet propulsion may make it possible for men to fly to other planets (see Rocket).

How Jet Propulsion Works

The Principle. You can understand the force, or *reaction*, which moves a jet engine if you watch a small floating log when a frog jumps off it. The action of the legs of the frog sends him through the air in one direction. His legs apply a reaction to the log, causing it to move through the water in the opposite direction.

A jet engine drives forward by using a similar reaction. The engine takes the place of the log. The jet exhaust takes the place of the frog. When the jet exhaust shoots backward into space, the reaction to it drives the engine forward. For this reason, jet engines sometimes are called *reaction-type* engines.

Many persons mistakenly believe that jet propulsion is caused by the exhaust gases "pushing" against the outside air. This is not so. In fact, jet propulsion will work just as well in a vacuum, or outside the earth's atmosphere, as long as oxygen is provided to burn the engine's fuel.

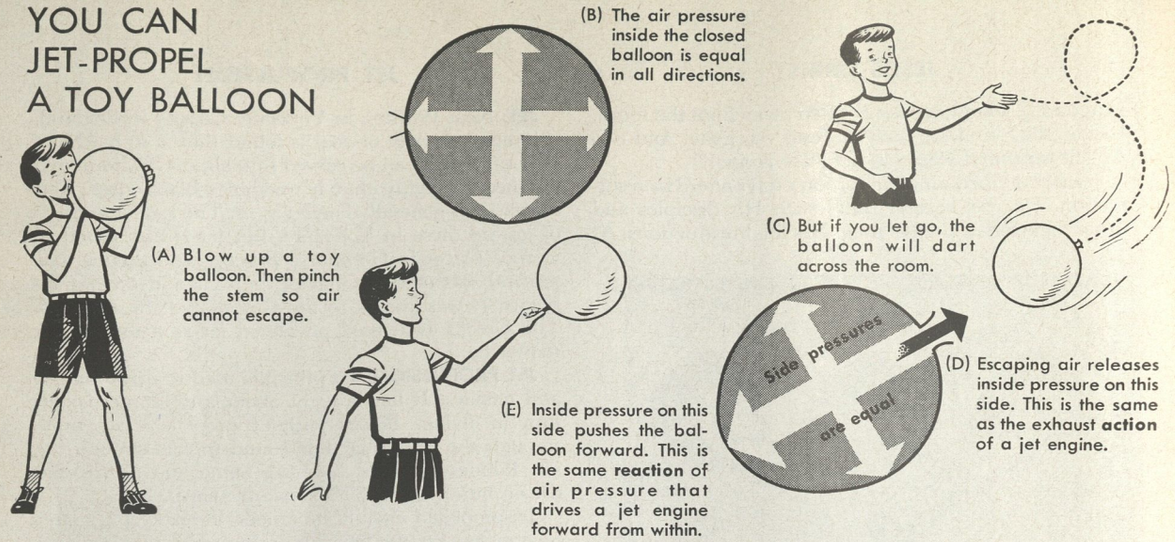
The English scientist Sir Isaac Newton in the year 1687 first stated the principle used by jet-propulsion engines as one of the laws of motion: *To every action there is an equal and opposite reaction.*

How Jet Engines Produce Power. Jet engines build up inside pressure by two methods: (1) burning a fuel that gives off hot gases, and (2) squeezing, or compressing, air that is mixed with the fuel. Some kinds of jet engines use only the first method, others use a combination of the two.

After a jet engine builds up inside pressure, it exhausts burned gases from its tail pipe in a stream called the *jet*, or *jet exhaust*. The reaction inside the engine to this jet exhaust drives the engine forward.

Thrust. The forward-driving force of a jet engine is measured in pounds of *thrust*. The thrust remains about the same at all flying speeds, which makes a jet engine particularly useful in high-speed aircraft. At the same time, the jet engine's horsepower, or ability to do work

YOU CAN JET-PROPEL A TOY BALLOON



in a given period of time, increases at higher flying speeds. This is just the opposite of a propeller-and-piston engine whose horsepower remains about the same at high flying speeds, but whose thrust decreases.

One pound of thrust is equal to one horsepower at a speed of 375 miles an hour. At this speed the horsepower of a jet engine of 3,000 pounds thrust would be just equal to a propeller-and-piston engine of 3,000 horsepower. But if the speed through the air is increased to 750 miles an hour, a jet engine of 3,000 pounds thrust will put out 6,000 horsepower. If a propeller-and-piston engine of 3,000 horsepower is driven through the air at 750 miles an hour, its thrust will drop to 1,500 pounds, even if its propeller efficiency is 100 per cent.

The following formula may be used to find the horsepower of an engine when the thrust and the air speed in feet per second are known:

$$\textbf{Horsepower} = \frac{\text{Thrust (lbs.)} \times \text{Air Speed (ft. per sec.)}}{550}$$

Here is an example of the use of this formula. You have a jet engine of 5,000 pounds thrust and you want to know how much horsepower it will develop while flying at 750 miles an hour (or 1,100 feet a second). You multiply 5,000 by 1,100, divide by 550, and find that the engine will develop 10,000 horsepower.

In the usual type of propeller-driven airplane, the fuel is burned inside the engine and the power is supplied to a propeller by a rotating shaft. The propeller produces thrust *by moving a large amount of air at a low speed*, and with little increase in pressure. In fact, the air is moved backward at a speed much lower than the airplane's speed. Thus, little energy is left in the air, and efficient flight at low speeds is possible. The jet engine produces thrust *by moving a relatively small volume of gases at high speed.* The speed of the jet exhaust must be high, since the amount of gas in the jet exhaust is much smaller than the amount of air moved by the propeller. This leaves a large amount of energy in the jet exhaust and the jet plane must fly fast in order to operate efficiently.

Types of Jet Engines

Turbojet is the most widely used jet engine. Most military and commercial jet airplanes are powered with turbojets. A turbojet is made up of a compressor, combustion chambers, a turbine, and a tail pipe, or exit nozzle, through which the jet exhausts. Turbojets produce from 3,000 to 10,000 pounds of thrust.

Two kinds of compressors may be used in turbojets. (1) A *centrifugal-type* compressor squeezes the air by bringing it into the center of a rapidly spinning wheel which throws the air toward the rim. There it enters a nearly circular expanding passage where its speed decreases and its pressure increases. (2) An *axial-type* compressor has several disks with a large number of small winglike blades around their rims, as in an electric fan. These disks are attached to a shaft that spins at high speed. Between each pair of disks is a row of blades which do not rotate. The air flows parallel to the spinning shaft, and each row of blades compresses the air a little higher than the pressure produced by the preceding row.

Both types of compressors raise the pressure of the air from three to six times after it enters the engine's air inlet. They spin around at speeds of 10,000 to 15,000 revolutions a minute.

After the air is compressed, it rushes into a set of combustion chambers. The air is mixed with fuel and burned. This creates greatly expanded hot gases which rush toward the tail pipe. Before these gases escape from the engine, they turn a turbine wheel which spins the compressor. This uses energy from the exhaust gases. This turbine wheel must be made of materials which can withstand temperatures as high as 1600° F. from the hot gases. See TURBINE.

Part of the energy which is left in the gases after they pass through the turbine produces thrust, and part is lost in the jet exhaust.

To obtain a large thrust from a jet engine, it is necessary to have a large weight of gas exhausted at high speed. The weight of gas in the jet exhaust comes from the air and fuel taken into the engine. A turbojet takes in large amounts of air and fuel. The exact amounts depend on the altitude and flight speed, as well as on the spinning speed of the turbine and compressor. A turbojet of moderate size uses about 360,000 pounds of air

each hour, or three tons a minute. It also requires about 1,000 gallons of fuel an hour. If a turbojet plane flies at 600 miles an hour, it travels only about six tenths of a mile for each gallon of fuel burned.

A turbojet engine is started by spinning the turbine with auxiliary power. A spark plug is used to start the fuel burning. After that the fuel mixture burns steadily as long as the engine keeps running.

Compared with the propeller-and-piston engine combination, a turbojet has advantages of lighter weight, smaller size, more power, and higher flight speeds. It has little vibration. It has the disadvantage of using more fuel at the lower speeds.

Turbojet with After-Burner. The thrust of a turbojet can be almost doubled by attaching an after-burner between the turbojet and the tail pipe. With after-burning, thrusts up to 12,000 pounds have been obtained. The after-burner works in a manner similar to a *ramjet* (see *Ramjet* in this article). Additional fuel is sprayed into the after-burner section and burned to raise the temperature as high as possible. The speed of the exhaust jet is thus increased. The turbojet with after-burning is used on many high-speed military airplanes.

Turboprop, or *propjet*, is the propeller-driving brother of the turbojet. Most of the thrust of the turboprop comes from a propeller which is driven by a gas turbine. The arrangement of the compressor, burners, and turbine wheel is similar to that of the turbojet. However, most of the energy in the hot gas is used to drive the turbine which turns the compressor and the propeller shaft. The energy left in the gas, after it passes the turbine and is exhausted as a jet, is partly used to produce thrust.

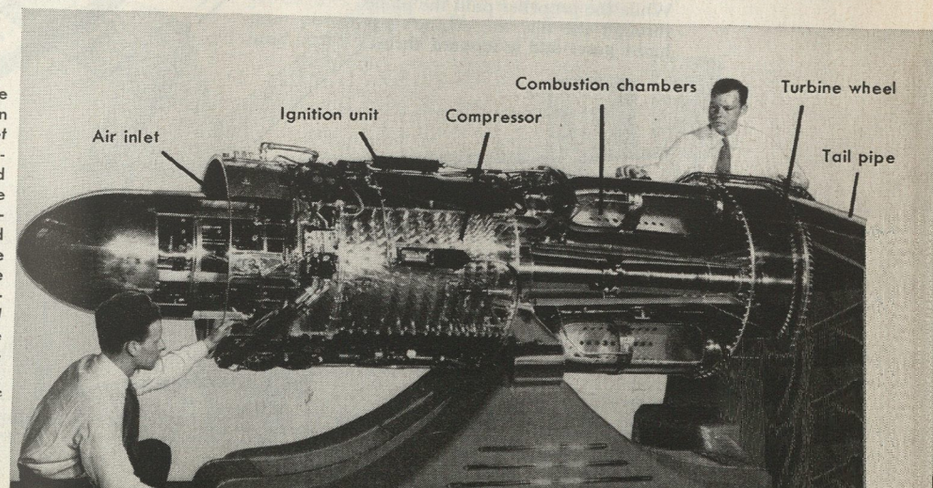
The turboprop can be made smaller and lighter than piston engines. Turboprops developing 6,000 to 10,000 horsepower are more compact than piston engines producing 3,500 horsepower. Since turboprops can produce so much power, they are suitable for long-range airplanes flying nearly at the speed of sound.

Pulsejet is a simpler engine than the turbojet. It has neither a mechanical compressor nor a turbine. It consists of a tube containing air-intake valves, a combustion chamber, and a tail pipe. The engine is started by spraying fuel into the combustion chamber through fuel nozzles. A spark plug in the combustion chamber ignites the first charge of fuel-air mixture. Air is forced into the tube entrance, causing the air-intake valves to open. This air mixes with the fuel in the combustion chamber, and burning starts when the mixture is correct. The pressure in the combustion chamber rises rapidly as a result of the burning, and the valves are forced shut. The gas from the combustion chamber then can only escape through the tail pipe. When the gas rushes from the combustion chamber, the pressure in the chamber drops so that the air pressure outside of the engine forces the air-intake valves open again. This permits air again to rush into the combustion chamber and mix with the fuel. The hot walls of the chamber set the mixture on fire. This process is repeated 50 to 250 times a second, and each time it causes an ear-shattering noise. Because of its noise the pulsejet is sometimes called a *stuttering stovepipe.*

The pulsejet is a light engine. It has few parts and is easy to build. In its present stage of development, the pulsejet burns about three times as much fuel as the turbojet. Pulsejets powered the first German guided missiles in World War II, the V-1 buzz-bombs. The pulsejet flies at fast speeds but slower than the speed of sound.

Ramjet has the simplest construction of all the jet-propulsion engines. It has no mechanical compressor or turbine. In fact, it has no moving parts except for a few accessories. The air entering the engine is compressed by being slowed down in an air-inlet *diffuser*. This diffuser is formed by varying the diameter of a circular tube so that the high speed of the entering air is reduced, and the energy due to the motion of the air is converted into pressure. The engine gets its name from this *ramming* action of the air. The engine operates best at speeds faster than sound.

The tube forming the diffuser is continued to make a combustion chamber and a tail pipe. Thus, the main part of the engine is little more than a long pipe with a specially shaped front end. Ahead of the combustion chamber there are fuel nozzles which spray the fuel into the air moving through the engine. After the engine has been started, the burning is continuous instead of pulsing, as it is in the pulsejet. Flame holders are located in the combustion chamber to keep the flame from being blown out by the air rushing through the engine.

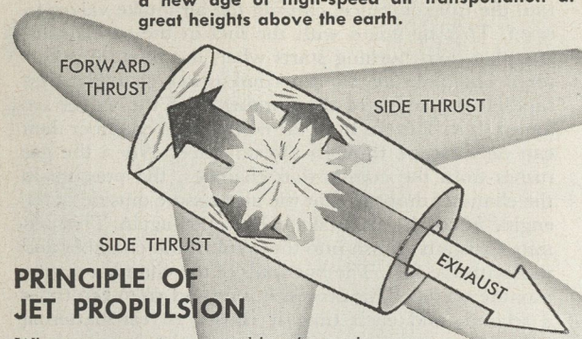


Turbojet Engine with its side cut away so the inner parts can be seen. Air enters the *air inlet* and is compressed in the *compressor.* The air then is mixed with fuel and burned in the *combustion chambers.* The resulting hot gases expand and rush toward the tail pipe. The rushing gases turn the *turbine wheel,* which spins the compressor. The gases rush out the *tail pipe,* causing a reaction force in the engine to drive the airplane forward.

General Electric

JET PROPULSION

Simple and efficient jet engines have ushered in a new age of high-speed air transportation at great heights above the earth.

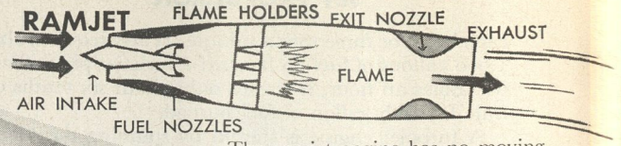


PRINCIPLE OF JET PROPULSION

When gases are compressed in a jet engine, forces are exerted in all directions. The sideward forces, or thrusts, equalize each other because they cannot escape from the engine. But the gases escaping out the rear allow the forward force to act, and the plane moves forward. Gases may be compressed mechanically, by combustion as in an automobile engine, or by both means.

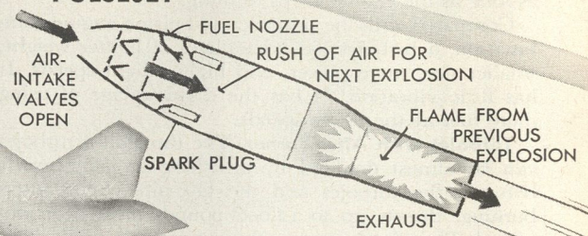
Types of Jets

RAMJET



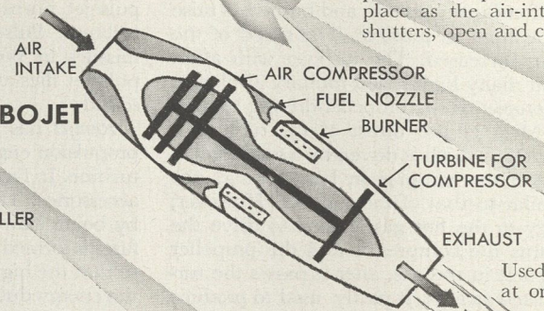
The ramjet engine has no moving parts. Air is rammed, or compressed, by forward movement of engine.

PULSEJET



The pulsejet gets its power from the pulselike explosions which take place as the air-intake valves, or shutters, open and close.

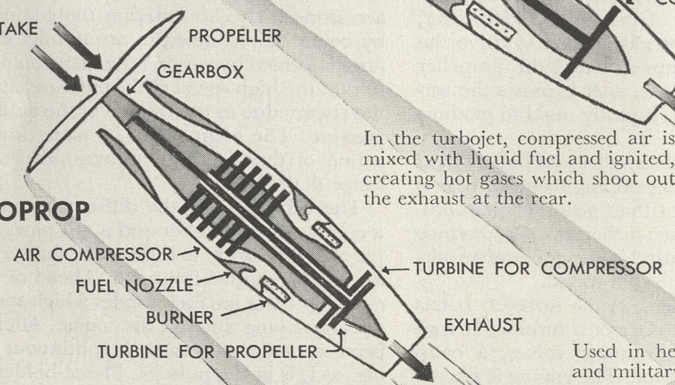
TURBOJET



Used in planes built to fly at or near speed of sound.

In the turbojet, compressed air is mixed with liquid fuel and ignited, creating hot gases which shoot out the exhaust at the rear.

TURBOPROP



The turboprop uses energy from burning gases to turn its propeller. While the propeller pulls the plane through the air, the engine's exhaust gases add a forward thrust.

Used in heavy commercial and military planes.

Provides greater takeoff power for large aircraft.

Uses of Jets

Ramjets are used in guided missiles and in gunnery-practice targets flying at great heights.

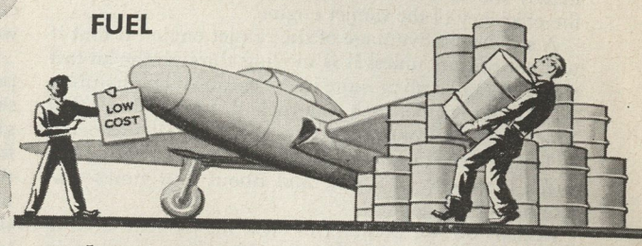
Buzz-bombs powered by pulsejets.

Pulsejets provide auxiliary power for planes with propellers.

Wingtip pulsejets and ramjets are used in helicopters.

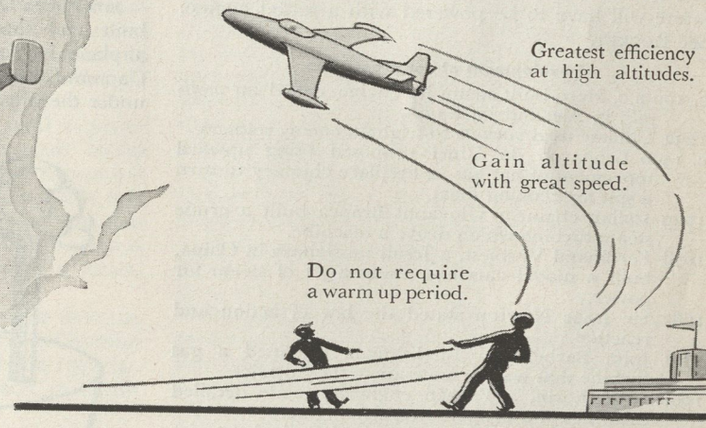
Advantages of Jets

FUEL



Jet engines burn large quantities of fuel, but they can use several kinds of low-cost fuel which piston engines cannot use.

PERFORMANCE



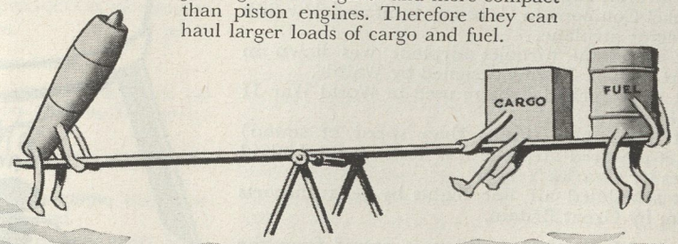
Greatest efficiency at high altitudes.

Gain altitude with great speed.

Do not require a warm up period.

CONSTRUCTION

Jet engines are lighter and more compact than piston engines. Therefore they can haul larger loads of cargo and fuel.



Because there are no moving parts in this engine, it can operate at higher temperatures than the turbojet. For this reason, burning can take place at approximately the best fuel and air mixture, which improves the efficiency of the ramjet engine.

A serious disadvantage of the ramjet engine is that it will not operate unless it is moving through the air fast enough to build up pressure in the combustion chamber. Some other engine, such as a rocket, is needed to bring it up to its minimum operating speed. It is considered to be most useful for airplanes and missiles flying between the speed of sound and about four times that speed.

Rockets do not breathe, or suck in, the surrounding air, as the other jet engines do. They carry oxygen to burn their fuel. The weight of the gas which can be released in the jet exhaust is therefore more limited than in other jet engines. Very high flying speed is necessary for a rocket to be efficient.

Since the rocket carries fuel containing its own oxygen, it burns about fourteen times as much fuel as the turbojet. However, it can produce more power than other types of jet engines described earlier in this article. Rockets have been used for both guided missiles and airplanes. Scientists believe any spaceship of the future will have to be powered with a rocket engine. See ROCKET.

Development of Jet Propulsion

c. 100 B.C. Hero built steam jet engine, called an *aeolipile*, in Alexandria, Egypt.
1232 Chinese used rockets to frighten enemy soldiers.
c. 1500 Leonardo da Vinci proposed using upward movement of hot gas in fireplace chimney to turn a spit for cooking meat.
1629 Italian engineer Giovanni Branca built a crude steam turbine which drove a machine.
1678 Ferdinand Verbiest, a Jesuit missionary in China, built a model carriage, using a jet of steam for power.
1687 Sir Isaac Newton stated the law of action and reaction.
1791 John Barber, an Englishman, patented a gas turbine that was an ancestor of the turbojet.
1908 René Lorin, a French engineer, made detailed drawings of a proposed ramjet engine.
1926 A. A. Griffith in Great Britain described theories of using gas turbines in aircraft.
1930 Frank Whittle of Great Britain patented design for a jet aircraft engine.
1939 Heinkel Company in Germany built and flew first jet-engine airplane.
1941 First successful turbojet airplane was flown in Great Britain. Engine designed by Whittle.
1944 First jet-propelled fighters used in World War II by Germans.
1947 First supersonic (faster than speed of sound) rocket-powered airplane was flown in the United States by Charles Yeager.
1952 First scheduled air line flights by jet transports begun by Great Britain.

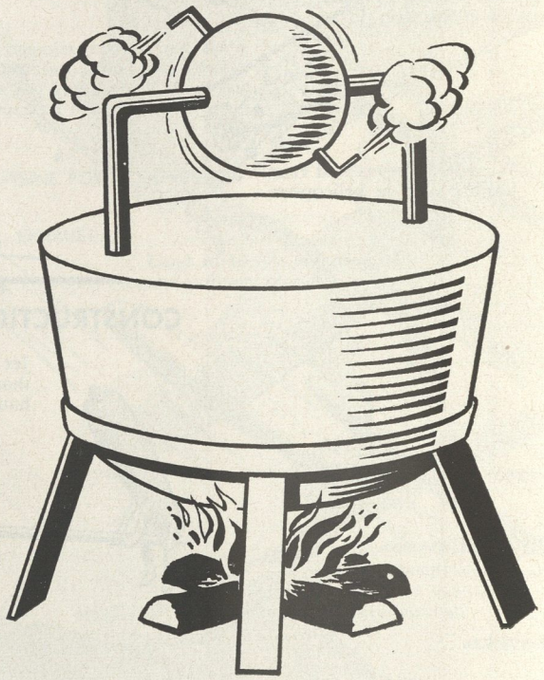
Jet Pioneers. More than 2,000 years passed from the time Hero built his first jet engine until anyone suggested using jet propulsion to fly aircraft. In 1903 an artist proposed a helicopter powered by steam jet propulsion, but no one took his suggestion seriously. The French military engineer René Lorin developed plans for a ramjet engine, but did not try to build it.

An American engineer, Edgar Buckingham, made a report in 1923 to the National Advisory Committee for Aeronautics on the possible use of jet propulsion in aircraft. He concluded that jet propulsion was impractical for speeds that seemed possible at that time, which were about 250 miles an hour.

In the early 1920's engineers began to realize that jet propulsion, and propellers driven by gas turbines, showed promise. They knew that to make practical engines it would be necessary to improve greatly the efficiency of compressors and turbines. They also saw the need for materials which could stand high temperatures. A. A. Griffith, one of the pioneers in aircraft gas turbine research, explained his early theories in England in 1926. In 1928 Frank Whittle, a young flight cadet in Great Britain's Royal Air Force, prepared as a part of his class assignments a paper discussing the possibilities of jet propulsion for aircraft. Whittle patented a design for a jet aircraft engine in 1930.

In the early 1930's, engineers in the United States and several European countries worked to develop a practical jet engine. Whittle had tested some of his designs by 1938. In the Paris aircraft exhibition of that year, the French engineer René Leduc displayed a model of an airplane powered with a ramjet.

Jets Put to Use. The Heinkel Company in Germany built and flew the first air-breathing jet-propelled airplane in 1939. In Italy, the jet-propelled aircraft Caproni-Campini CC2 was built and flown in 1940 under the direction of S. Campini. These first two jet



Jet Engine Invented More Than 2,000 Years Ago in Egypt by the scientist Hero, and called an aeolipile. When water in closed kettle boils, steam goes through pipes into ball. Jets of steam shoot from bent tubes, causing ball to spin around.

airplanes to fly did not have very successful engines.

The first flight of an airplane using a turbojet of practical design was in Great Britain in 1941. A Whittle engine was installed in a Gloster E28/39 airplane and was flown by Flight Lt. P. E. G. Sayer.

The first jet airplane flown in the United States was built by Bell Aircraft Corporation. Its two turbojets, built by the General Electric Corporation, followed Whittle's design. This airplane, known as the XP-59A, was test flown in 1942 by Robert Stanley. During 1942, also, the German Junkers Jumo-004 jet engine was installed in a Messerschmitt Me-262 and flown. This was the first successful jet-propelled combat airplane. In 1944 jet airplanes began to be used by German fighter squadrons.

Germany took the lead in the use of jet propulsion in guided missiles during World War II. See GUIDED MISSILE.

Postwar Development. In 1947 the rocket-powered Bell X-1, built in the United States, became the first airplane to fly faster than the speed of sound. This plane was launched from a bombing plane in the air and piloted by Charles Yeager. In France in 1949 the engineer René Leduc designed a ramjet airplane which was launched from the back of a transport airplane.

Douglas Aircraft Company built an experimental airplane in the United States, using both a turbojet engine and a rocket engine. This D-558-2 skyrocket was flown higher than fifteen miles and at almost twice the speed of sound, by William Bridgeman in 1951.

Both pulsejets and ramjets have been used to power helicopters. The tips of a helicopter's rotor blades must rotate at high speed. When the blade is powered by an engine turning the rotor shaft, one result is that the body of the helicopter tends to turn in a direction opposite to the turning of the rotor. This is known as *torque*. Torque is eliminated when the rotor is turned by jets located at the blade tips.

Great Britain and Canada have led in the development of jet passenger transports. The British Overseas Airways began scheduled jet air liner flights in 1952, between London and Johannesburg, Union of South Africa.

The importance of the speed of jet propulsion in military planes was demonstrated on a large scale in the Korean war. This caused the air forces of all world powers to step up research and production of combat airplanes powered with jet engines. H.S.S.

Terms Used in Jet Propulsion

Athodyd is a technical name for a ramjet. It is made up from a contraction of the words Aero-Thermo-Dynamic-Duct.

Beeper is a person who operates a pilotless aircraft by remote control.

Blow Torch, Flame Thrower, Squirt, Stovepipe, and **Blast Furnace** are slang terms for a jet airplane.

Building a Fire, or **Sparking It Up,** means to start a jet engine.

Burner Drag is the total drag of all the parts of a jet-engine system, including the drag of the combustion-chamber walls, the flame holders, igniters, and other jet units.

Charging Stage means the stage during which air is rammed into the air duct of a pulsejet.

Chuffing, or **Chugging,** is the intermittent burning of a rocket accompanied by a puffing noise.

Flame Out means the engine has stopped.

Flame Stability means that the fuel in the jet engine must burn steadily over a wide range of temperatures and pressures.

Resonant Jet, Intermittent-Firing Duct Powerplant, or **Aeroresonator,** are other terms meaning pulsejet.

Rough Burning means the rapid changes in pressure at the beginning of the burning of a ramjet or rocket.

Self-Piloting means a ramjet ignition system which uses part of the fuel-air mixture as a pilot flame to ignite the rest of the fuel-air mixture.

Steady Boil means that the jet engine is running smoothly.

Thermojet is any kind of jet engine which brings in air from the outside to be used in combustion.

Thrusty Day is slang for a day with good jet-flying weather.

Turn Down the Wick means to cut the engine speed.

Wick Willy, Firecan Jockey, Flame Flier, or **Pipe Pilot** are slang terms meaning a jet airplane pilot.

See also AERODYNAMICS (Supersonic Flight); AIRPLANE; AVIATION; GUIDED MISSILE; ROCKET; WHITTLE, FRANK.

JETSAM, *JET sam.* See FLOTSAM, JETSAM, AND LAGAN, OR LIGAN.

JETTY, *JET th.* A jetty is a pier or wall built into a river or harbor. It may be made of timber and stone, or of stone alone. A jetty is used as a breakwater, to break the force of rough waves, or to deepen the channel by increasing the current. Many harbors have great walls or banks built out into the sea for added protection. Among such protected harbors are those of Dunkirk and Calais in France.

The Columbia River on the Pacific Coast of the United States has the longest jetty in the world. It is nearly four and one-half miles long. Before it was built, ships sometimes went aground in the harbor because it contained shifting sandbars. Now there is a single channel twenty-nine feet deep.

Mississippi Jetties. The Mississippi carries great quantities of fine sand and silt to the place where it empties into the Gulf of Mexico. It flows into the Gulf through four mouths, called *passes*. In 1874 these mouths were all so choked that large steamers could not get through. Captain James B. Eads suggested building two long jetties along the banks and out into the Gulf. These walls would force the water through a narrower channel, making the current carry the sand and silt out to sea.

The jetties in the South Pass were finished in 1875. Rows of piles 1,000 feet apart were first driven into the bottom. Then willow logs fastened with planks, called timber *mattresses*, were sunk by piling stones on them. The bottom layer of mattress was fifty feet wide. Each layer was narrower until the one at the top measured only twenty feet wide. These dikes became filled with silt and sank deeper until they became immovable. Within two years the river had made a channel thirty feet deep. A.T.G.

See also LEVEE; MISSISSIPPI RIVER.

JEVONS, *JEHV unz,* **WILLIAM STANLEY** (1835-1882), was an English philosopher and economist. His most noted work was to simplify logic for beginning students of philosophy. He was born in Liverpool, and taught at University College, London.

Acme

JEW. A Jew is someone who believes in the religion called *Judaism*. A person who does not practice Judaism may also be called a Jew, if he is born of Jewish parents and is interested in his people. This is because Jews have many things in common besides the Jewish religion. One of these is their long history.

Jewish History

Beginnings. The father of the Jewish people was Abraham. He was born in Mesopotamia about 3000 B.C. Abraham left his home there and traveled to Canaan, the country which we call Palestine. He was known as Abraham the Hebrew, and that is one reason his descendants are sometimes called *Hebrews* instead of *Jews*. Abraham was one of the first men to worship the One God. This belief in One God is the most important teaching of both Judaism and Christianity. Abraham's grandson, Jacob, who was also called Israel, had twelve sons. The twelve tribes which later made up the Jewish people were the descendants of Israel's sons. That is why the Jews are sometimes called the *Children of Israel*, or *Israelites*.

For many years the Jews were slaves in the land of Egypt. In about 1400 B.C. their great leader and teacher Moses led them out of Egypt as free men. Jews still celebrate the festival of Passover each year in memory of their being set free from slavery.

The Jews wandered in the desert between Egypt and Palestine for forty years. During that time they received the Ten Commandments at Mount Sinai and many of the other great teachings of the Bible. They fought many battles and suffered severe hardships.

After Moses died, Joshua led the Jews across the river Jordan into Canaan. It took more than two hundred years for them to conquer the country. They were led at this time in peace and war by men and women called Judges. Some of the most important of these were Gideon, Deborah, and Samson. In about the eleventh century B.C. the great prophet Samuel was recognized as the leader of his people. He and the other prophets after him tried to keep the Jews loyal to the worship of the One God. They had to do this because many of the natives of Canaan who worshiped idols of stone and wood tried to win the Jews to their religion.

In Samuel's time the twelve tribes, which had been only loosely joined together, united to form a monarchy. Saul was chosen as the first King. His son, Jonathan,

did not take his place. Instead, David, who had led the Jewish armies against the Philistines, became king. According to tradition, David wrote many of the beautiful Psalms which are part of the Bible. He was called the "sweet singer of Israel." David's son Solomon built the first Temple at Jerusalem for the worship of God. He constructed many other beautiful buildings and made his country great and powerful.

Israel and Judah. When he died, political and economic troubles split the kingdom apart. Ten tribes broke away and set up an independent country in the north of Palestine called the kingdom of Israel. The other two tribes of Benjamin and Judah formed the kingdom of Judah in the south. The citizens of the southern kingdom were known as Judeans. The present-day word *Jew* comes from this term.

The northern kingdom of Israel was destroyed by the Assyrians in 722 B.C. Its people were deported and the territory was colonized by peoples from the Assyrian Empire. The ten tribes of Israel which apparently disappeared are often called the "ten lost tribes."

The southern kingdom of Judah lasted only a short time longer. In 586 B.C. the armies of Babylon captured Jerusalem and burned down the Temple. Some Jews were carried into Babylonia as captives. But many were left in Judea.

The great prophets Amos, Hosea, Isaiah, and Jeremiah lived and taught during the existence of the two kingdoms. Their high moral and ethical teachings are still tremendously important to Judaism, Christianity, and Islam.

Rebuilding of the Temple. The Jews spent many years as captives in Babylon. The prophet Ezekiel encouraged them to believe that some day they would return to their homeland. In 538 B.C. the Persian emperor, Cyrus, permitted the Jews to return to Jerusalem and rebuild the Temple. It was finally completed in 516 B.C., seventy years after its destruction. Two of the great leaders of the following period were Ezra and Nehemiah. They helped strengthen the Jewish religion and nation.

The Jews enjoyed almost complete independence under Persian rule. Even after Alexander the Great defeated the Persians in 332 B.C., the Jews lived in freedom and at peace. When Alexander died, the rule of Palestine fell to the Ptolemies of Egypt. For the most part they kept up Alexander's liberal way of governing. The Seleucid kings of Syria, who later ruled Palestine, at first followed this same policy. The Jews were allowed to practice their religion in freedom and to conduct their affairs without interference. But in 168 B.C the Syrian ruler, Antiochus Epiphanes, tried to force the Jews to stop worshiping the One God. He desecrated the Temple in Jerusalem and set up idols for the people to bow down to. A small group of patriots under the leadership of Judah the Maccabee defeated the forces of the Syrian emperor. The present day Jewish festival of Hanukkah celebrates the winning of religious freedom by the Maccabees in 165 B.C. The Jews once again set up their own kingdom under the Maccabees. This state existed for about a hundred years.

Destruction of Jerusalem. Because they were weakened by quarrels between rival parties, the Jews were

Acme

Lighting the Sabbath Candles is a weekly ceremony. The Jewish Sabbath is celebrated on Saturday. The feast and candlelighting take place just before sunset on Friday. The woman prays for a peaceful and joyous day as she lights the tapers.

forced to accept Roman rule in 63 B.C. The Romans governed Palestine through a series of puppet rulers. The Jews resented their cruel government. Finally in 68 A.D. they revolted. They were unsuccessful, and in 70 A.D. the Romans captured Jerusalem and destroyed the Temple. This ended until modern times the existence of an independent Jewish state in Palestine.

Long before the Romans had destroyed Jerusalem, Jews had left the land of Israel to settle in other countries. More than a million lived in Egypt, especially in Alexandria. Many others were inhabitants of Syria, Babylon, and various parts of Asia Minor. Still others had emigrated to Greece and Rome and other parts of the then known world. But after the destruction of their native land, Jews emigrated in greater numbers to all parts of the Roman Empire. Some settled in North Africa and Spain. During the early Christian centuries many Jews moved into France and Germany. Later they went to England, Central Europe, Poland, and Russia.

Although the Romans had ruined their homeland and their Temple, the Jews still were loyal to their religion. They turned with renewed vigor to the study of the Bible and Jewish tradition. Great schools for studying the teachings of Judaism, or *Torah*, were established in Palestine. They continued to exist for more than two hundred years. In Palestine about the year 200 A.D., Rabbi Judah Hanasi (Judah the Prince) completed the *Mishnah*, the first code of Jewish teaching and law. It is based upon explanations and interpretations of the Bible.

In Babylonia, too, schools and academies for the study of the Torah were established. These produced the *Talmud*, which was finally completed about 500 A.D. The Talmud, like the Mishnah, contains explanations and interpretations of Biblical law. It is much larger than the Mishnah, which is also included in it. The Bible and Talmud are the two most important books of the Jewish religion. In all the countries in which they settled, the Jews brought with them their religious teachings. Young and old studied them so much that the Jews soon became known as "the people of the book."

The Jews in Europe. Much of the history of the Jews in Europe during the Middle Ages is one of persecution and suffering. The age was one of religious bigotry and intolerance. It was natural then that the Jews, whose religion was different from that of the rest of the people, should be oppressed. In the early centuries of the Christian Era in Europe, good and peaceful relations between Christian and Jew were common. But as religious intolerance increased, the persecution of the Jews grew more severe. Even so, in all the countries of Europe at one time or another Jew and Christian lived

together in peace and harmony. From time to time, however, intolerant leaders or ignorant bigots led the people to make trouble for the Jews.

During the Crusades many innocent Jews were massacred. Sometimes this was done misguidedly in the name of religion. More often the reason was the desire of vandals to loot Jewish homes and places of business. In many countries unjust laws were passed which stopped Jews from owning land and becoming farmers. In others they were forced to live in special sections of the city called *ghettos*. Very often the only way of

Acme

A Jewish Boy at His Bar Mitzvah. The youth becomes a member of his congregation after this ceremony. In his arms he holds a covered Torah, the sacred writings of the Jewish faith.

earning a living left open to them was money lending. This, too, caused misunderstanding and unfriendly relationships. Conditions became even worse when still other laws were passed in the 1200's forbidding Jews and Christians from living and working together as good neighbors.

Only the Jews' faith in God gave them courage to overcome their sufferings. They continued to study the Bible and their tradition. In France, Germany, and other countries great rabbis wrote religious books which helped the people to understand and keep up their religion. One of the best known of these rabbis was the man known as "Rashi," who lived in France during the 1000's. He wrote a commentary on the Bible and the Talmud which is still of great value to students.

One of the happiest periods in Jewish history is known as the Golden Age of Spain. This began in about the A.D. 900's when the Arabs ruled the country. For several hundred years Jewish philosophers, poets, and scholars produced important literary works. Among the best known were the poet-philosophers, Solomon ibn Gabirol and Judah Halevi, and the great philosopher and rabbi, Moses Maimonides. Maimonides later traveled to Egypt, where he was physician to the ruler of the country. His great philosophical work is called *The Guide to the Perplexed*.

After several unhappy centuries in Europe, the lot of the Jews began to improve. The 1700's were the turning point. The American and French revolutions made people interested in the rights of liberty which belong to every man. Writers and thinkers declared that all men, no matter what their religion might be, were entitled to the rights of citizenship and freedom. Gaining freedom was a slow and difficult job for the Jews. But by the middle 1800's they were recognized as free and equal citizens by many of the countries of Western Europe. One of the great Jewish leaders in this battle for freedom was the philosopher, Moses Mendelssohn. Once the Jews were given the right to share fully in the life of the countries in which they lived, they began to make valuable contributions in science, art, literature, and scholarship. From the time of their "emancipation" until 1933, when Adolf Hitler began to persecute Jews once more, they played an active part in building European culture.

Acme

Two Boys Hold Covered Torahs while another chants during a Jewish religious service. The Torah is the foundation of the faith. The boys are wearing skullcaps and prayer shawls.

Jews in the New World. The history of the Jews in America begins with its discovery. A number of Jews sailed with Columbus on his first voyage. According to accounts of the voyage, Columbus' interpreter, Luis de Torres, who was Jewish, was the first man of the expedition to set foot on American soil. The first settlements

Lothrop Lee and Shepard from "One God" by Florence Mary Fitch

A Confirmation Class in a Reform Temple. Jewish Children Are Confirmed on the Holiday Called *Shevuoth*

of Jews in the New World were in the West Indies and South America during the 1500's.

The first Jewish community in North America was at the Dutch colony of New Amsterdam in 1654. The second was at Newport, R.I., in 1658. The synagogue of Newport, built in 1763, still stands and is a national historic site.

The Jews' long years of suffering had given them an appreciation of liberty and freedom. When the Revolutionary War broke out, they were eager to help win American independence. Many fought with the armies of George Washington. One of the patriots of the Revolution was Haym Salomon, who freely gave up his entire fortune to aid the struggling colonial army.

The freedom and opportunities of the new United States caused many people from Europe to come to America. Among these were a large number of Jews from Germany who came to American shores during the period from 1815 to 1880. The earlier Jewish settlers had mostly been descendants of Spanish and Portugese Jews. From 1881 to 1914, many Jews fleeing from the terrible oppression of the Russian Czarist government came to the United States from Russia and Poland. The total Jewish population of the United States in 1948 was about five million.

The religious persecution of Europe found no place in the United States. The spirit of freedom and liberty in which it was founded enabled Jews to share in every activity of the nation together with their neighbors of other faiths. Some discrimination against Jews does, however, still exist in the United States.

The Nazis and Anti-Semitism. In 1933 Adolf Hitler, the leader of the Nazi party, seized control of Germany. Anti-Semitism, or hatred of the Jews, was an important part of his program. Hitler used anti-Semitism as a trick to blind the German people to his ambitions. He untruthfully blamed all the troubles of Germany upon the Jews. He repeated his tales and falsehoods so often that the German people began to believe them. While they were busy attacking and persecuting the Jews, Hitler was able to make himself complete dictator of Germany. He then began to persecute many Protestant and Catholic religious leaders, too. The liberties of all the German people were lessened.

But the greatest sufferers were the Jewish people. At first they were not allowed to be doctors or teachers. Later their property was taken away and they were subjected to inhuman and cruel punishments. Finally in 1939 the Germans began a campaign to kill all the Jews of Europe. More than six million men, women, and children of the Jewish faith were put to death before the Germans were defeated in 1945. This terrible massacre is one of the blackest pages in the history of all mankind.

The anti-Semitism begun by Hitler did not completely die down with his death. Many of the European countries became infected with it. That is one reason why a large number of the few remaining Jews in Europe emigrated to Palestine and other countries. Some of Hitler's anti-Semitism reached the United States. Only a few Americans, however, were tricked by Hitler's teachings of hate.

The Jewish Contribution to Civilization

The Jews, both as a people and as individuals, have given much to our civilization and culture. The Bible was written almost entirely by Jews. Its lofty teachings of the Ten Commandments and love of neighbor have been accepted throughout the world as guides to right conduct. The great goal of universal peace and brotherhood was proclaimed by the Jewish prophets Isaiah and Hosea almost three thousand years ago.

Jesus was a Jew. So too were the apostles and most of the early Christians. Christianity has often been called the daughter of Judaism. Islam also is based in large part upon Judaism.

In other fields besides religion, individual Jews have added much to the world as we know it. Many notable achievements have been made by men and women of the Jewish faith in all fields of human activity. I.J.R. and W.F.Ro.

Related Subjects. The reader is also referred to the following articles:

FEASTS, FASTS, AND CEREMONIES

First Fruits	Passover	Rosh Hashanah
Hanukah	Pentecost	Tabernacles, Feast of
Jubilee	Purim	Yom Kippur

LAW, SACRED PLACES, AND OFFICIALS

Cities of Refuge	Rabbi	Tabernacle
High Priest	Sabbath	Talmud
Kosher	Sanhedrin	Temple
Oral Law	Synagogue	Ten Commandments
Priest		

UNCLASSIFIED

Ancient Civilization (Religion and Ethics)	Ghetto	Kosher
Bible (with list)	Hadassah	Maccabees
B'nai B'rith	Hebrew Language and Literature	Messiah
Calendar (Hebrew Calendar)	Home Life (Hebrew Home Life)	Palestine
Dancing (Oriental Dance)	Israel	Patriarch
Dress (color plate, Costumes of Ancient Peoples)	Jehovah	Pharisees
Gentile	Jewish Welfare Board	Sadducee
	Judaism	Scribe
		Yiddish Language and Literature
		Zionism

JEWEL. See BEARING; GEM.

JEWEL CAVE. See NATIONAL MONUMENT.

JEWELER. See JEWELRY (Vocational Opportunities).

JEWEL FISH. See FISH (color plate, Tropical Fresh-Water Fish).

JEWELRY, *JOO el rih.* The custom of wearing personal ornaments is as old as man. The savage puts pieces of bone, wood, or iron in his ear, lip, or nose. He makes necklaces and bracelets from strings of teeth, pebbles, seeds, or shells. Men probably made gold and silver jewelry soon after they discovered these metals. The attractive color of gold and the ease with which it can be shaped, or worked, has always made it the chief metal used for jewelry.

The ancient peoples produced jewelry of great beauty, using only simple tools and the skill of their own hands. In Egypt, jewelry formed an important part of the costume. Egyptian jewelers produced elaborate pieces which were worn by both men and women. The Greeks were highly skilled in the various processes of working gold. Greek jewelry is often remarkable for its delicate design. The jewelry of the Romans is more splendid. The Etruscans produced beautiful metalwork.

During the Renaissance, jewelry designs became quite elaborate and richly decorated with enamel, gems, and pearls. Precious or semiprecious stones were set flat, with a backing of metal. In the 1500's a better method of cutting diamonds led to lighter and more graceful settings. This method of cutting produced diamonds somewhat in the shape of a rose, called rose diamonds.

In Central and South America, the Indians were making excellent articles of jewelry long before Columbus arrived. A large quantity of jewelry was found in tombs at Monte Alban, near Oaxaca, Mexico.

The modern art of making jewelry requires a high degree of skill. Jewelers use many machines, but much of their work is still done by hand. London, Paris, and New York City are the chief centers of jewelry manufacture. A large amount of gold-plated and gold-filled work is made, besides jewelry of the best quality. Cheap metal alloys and glass or paste imitations of precious stones are used in even greater quantity. Certain cheaper types of ornaments often called costume jewelry are made of almost any material, including wood, plastics, leather, cork, and glass, as well as metal.

Choice of Jewelry. Styles in jewelry change, but not so quickly as styles in clothes do. Yet a fine piece of jewelry is always in good taste if it suits the occasion and the wearer. Elaborate jewelry would not be suitable with simple sports clothes, but it might be entirely suitable for evening wear. Children do not wear jewelry, except, perhaps, for one or two simple pieces.

Vocational Opportunities are many and varied in the field of jewelry. They range all the way from the artist who originally designs the pin, brooch, or ring to the jeweler and the expert in precious stones who determines the quality of the gem and appraises its value. The designer must wait until the styles for next year are set before he can create his patterns to go with them. The field of costume jewelry has expanded rapidly. Large department stores design much of their own costume jewelry, and there are many opportunities also for sales persons in the jewelry sections. Jewelry designing for factories involves more specialization than designing for exclusive shops. The designer may be either a free lance artist, or a member of the staff. W.M.Mi.

Related Subjects. For list of stones and minerals used in jewelry that are described in THE WORLD BOOK ENCYCLOPEDIA, see the article GEM. For other information, see the following:

Bead	Gold (Uses of Gold)	Platinum
Birthstone	Hobby (Books about Hobbies)	Ring
Brooch	Ivory	Silver
Coral	Jet	Tiffany, Charles
Enamel		Watch

Questions

Why has gold always been a popular metal for jewelry?

What is a rose diamond?

For how long have people worn personal ornaments?

What sort of "jewelry" do savages have?

What ancient peoples produced fine jewelry?

What sort of jewelry was produced during the Renaissance?

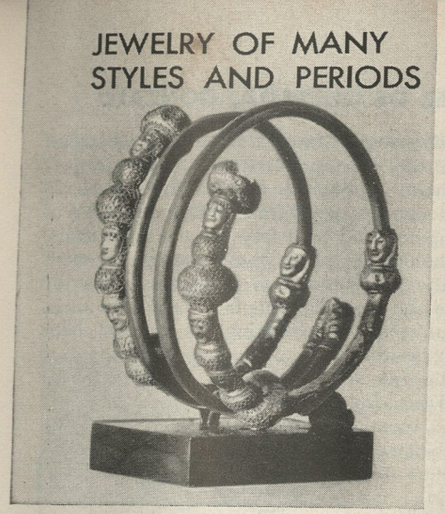
What cities are the jewelry centers of the world?

What should be considered in choosing jewelry to wear?

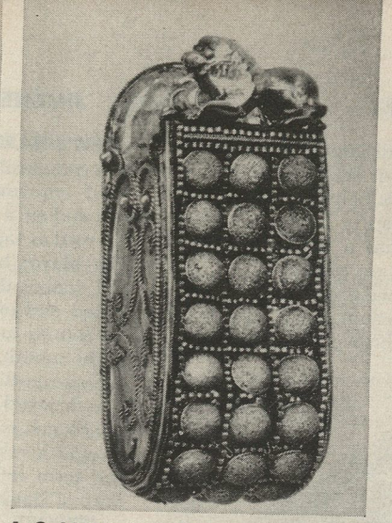
JEWELS OF THE MADONNA. See OPERA (Some of the Famous Operas).

JEWELWEED. See FLOWER (color plate, Unusual Flowers and Plants of North America).

JEWETT, SARAH ORNE (1849-1909). See AMERICAN LITERATURE (History [Realism and Regional Writing]).

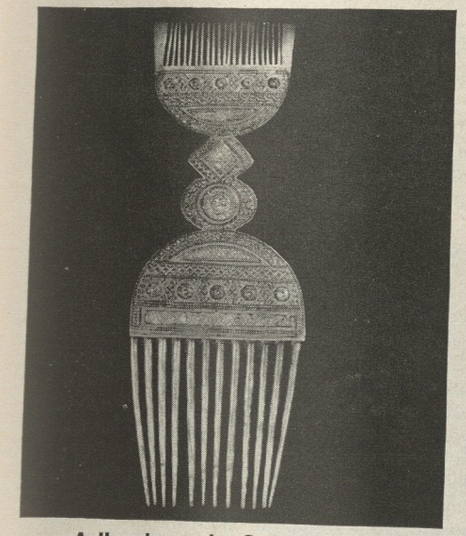


Spiral Bracelets of gold-plated bronze, made in Italy about 600 B.C.



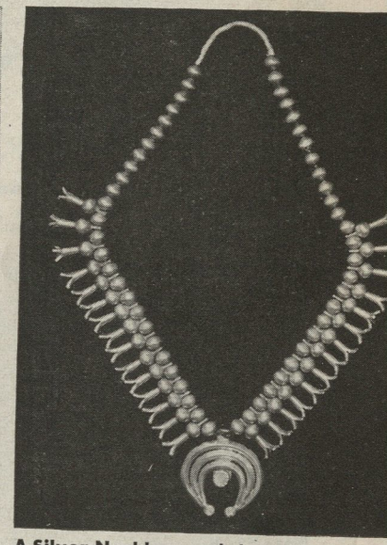
A Gold Earring of the Etruscan civilization in Italy, made about 450 B.C.

A Silver Earring 11 inches long, such as the Bolivian Indian women wear



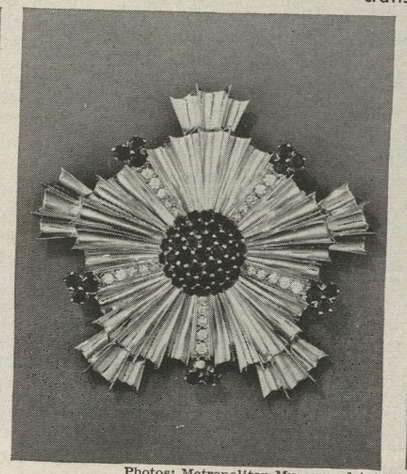
A Handsomely Ornamented Arab Comb, with contrasted gold and silver bands

A Woman's Heavy Necklace from British Somaliland in eastern Africa

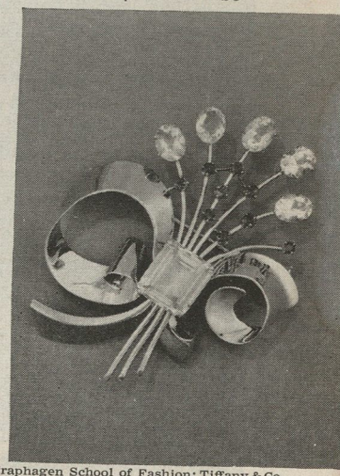


A Silver Necklace made by a skilled craftsman of a Hopi Indian tribe

A Golden Crown of the sort worn by a girl of Norway on her wedding day



A Modern American Brooch, made of sapphires and aquamarines in a gold setting

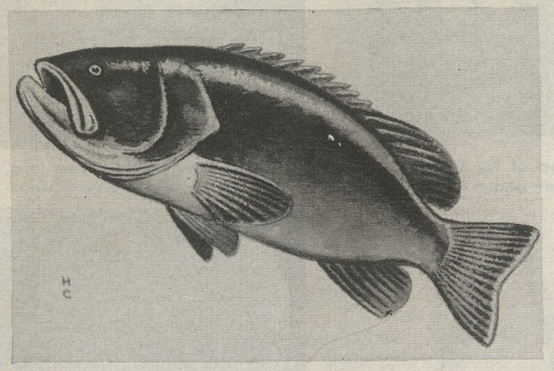


An American Clip-on Brooch of sapphires, diamonds, and gold

Photos: Metropolitan Museum of Art; Traphagen School of Fashion; Tiffany & Co.

JEWFISH is the name of several large fish also called *groupers*, which are the southern relatives of the sea bass family. The *spotted jewfish* is between two and six feet long. It lives along the coasts of Florida and from the West Indies to Brazil. It has a huge mouth and strong teeth, and feeds greedily on smaller fish.

The *black jewfish* sometimes weighs as much as 500 pounds. It lives between Charleston, S.C., and Brazil. Its color varies from chocolate-brown to blackish-gray.



The Black Jewfish of the Warmer Parts of the Atlantic

Its great strength and courage make it a good game fish for sportsmen.

The *California jewfish* lives in the Pacific Ocean, off the coast of Southern California northward to southeastern Alaska. It, too, is a delight to sportsmen, and is one of the favorite game fish of Catalina Island. This fish is brownish-colored with greenish-black blotches. The largest California jewfish are six feet long. L.P.Sc.

Classification. Groupers belong to the family *Epinephelidae*. The spotted jewfish is *Promicrops itaiara*. The black jewfish is *Garrupa nigrita*. The California jewfish is *Stereolepis gigas*.

JEWISH CALENDAR, or **HEBREW CALENDAR.** See CALENDAR.

JEWISH FEASTS. See JEW (list of Related Subjects); JUDAISM.

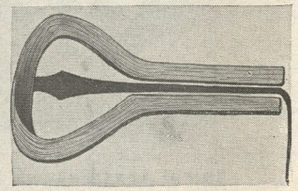
JEWISH LITERATURE. See HEBREW LANGUAGE AND LITERATURE.

JEWISH WELFARE BOARD, NATIONAL, is an organization of individuals and groups interested in the well-being and development of Jews of the United States. It has 288 member organizations and 427,000 individual members. The Welfare Board works with Jewish organizations, with the United Services Organizations, and with the Veterans' Administration.

The Welfare Board has headquarters in New York City. It was founded in 1917. Its publications include a quarterly, the *Jewish Center*, and a monthly bulletin which is sent free to members.

JEWISH WOMEN, NATIONAL COUNCIL OF, is an organization made up of Jewish women in the United States. The group promotes health, recreation, and social welfare in local communities. It also works for better understanding of national and international affairs. Many needy and immigrant persons are helped by the Council. Founded in 1893, it has about 78,000 members.

JEW'S-HARP is a small musical instrument which has little practical use in music. It is used chiefly for personal enjoyment. A flexible metallic reed is set at one end of a curved metal frame. The other end of the reed is tapered and bent forward at a right angle. The player holds the metal frame against the teeth and makes the reed vibrate or move by hitting the forked end of the reed with his free hand. The musical sounds are made by changing the size and shape of the mouth cavity.



A Jew's-Harp

Some authorities say that the word came from the French *jeu*, meaning *play*. Others believe that the term refers to the harp of David. C.B.R.

JEYPORE, *JI poor*, or **JAIPUR.** See INDIA (Cities).

JEZEBEL, *JEZ eh bel* (9th century B.C.). See AHAB.

JHELUM, *JA lum*, **RIVER.** See KASHMIR.

JIBUTI. See DJIBOUTI.

JIDDA, or **JEDDA.** See ARABIA (Political Divisions).

JIG. See FOLK DANCING.

JIGGER, or **CHIGGER.** These names are used for two different kinds of pests that attack men. One is the Chigoe flea, and the other is the larva of a harvest mite. See CHIGOE.

The harvest mite is a tiny red creature with a body divided into two parts. It creeps into skin pores and hair follicles to feed, causing a rash and instant itching. The female chigoe buries herself in the flesh and lays eggs which produce wounds and rashes which may become infected. The harvest mite usually attacks mice, turtles, or other small animals, but sometimes it attacks man.

The harvest mite is merely a nuisance in North America and Europe. But in Oriental countries and many Pacific islands, it is a serious danger because it carries a typhuslike disease called Japanese river fever, or *Tsutsugamushi*. The harvest mite usually gets the disease from infected rodents. The larvae catch the disease, for only they are parasitic. The mite keeps the disease during its nymphal and adult stages, and gives it to the larvae of the next generation, which pass it on to man. Harvest mites are common in the Middle West and the South, where they are a great annoyance to farmers during the harvesting of the hay crop.

Jigger bites can be prevented by using sulfur or naphthalene in the stockings or underclothing before going into the woods. After a person has been bitten, he can treat the bites with warm salt or soap baths, or a 1 per cent lysol solution. C.D.D.

See also ARACHNID.

Classification. The Chigoe flea is classed as *Tunga penetrans* in the *Hectopsyllidae* family. Harvest mites belong to the genus *Trombicula* of the superfamily *Trombidoidea*, order *Acarina*. The North American chigger is *Trombicula alfreddugesi* (*irritans*).

JIMÉNEZ DE QUESADA, *hee MAY nayth day kay SAH-thah*, **GONZALO** (1500?-1579?), was a Spanish explorer of South America. He spent most of his life searching for the land of gold known as "El Dorado," about which there were many stories. He never found El Dorado, but he opened up a new territory which is now Colombia,

and founded the city of Bogotá, the capital of Colombia.

Jiménez de Quesada was born in Granada, Spain. He went to South America in 1535. J.Cor.

JIMMU, or **JIMMU TENNO** (711-585 B.C.). See JAPAN (History).

JIMSON WEED. This large bushy plant grows in both Tropical and Temperate zones of North America, and is very common in the central United States. It is an annual plant, blooming only once. It reaches a height of five feet, with erect flowers about four inches long which are white or colored with violet. It has poisonous seeds. The name *Jimson* is a popular shortening of the name of the early Virginia settlement of Jamestown. See also DATURA; FLOWER (color plate, Flowers of Plants Harmful to Man); STRAMONIUM. P.C.S.

Classification. Jimson weed is in the *Solanaceae* family. Its botanical name is *Datura stramonium*.

JINGLING JOHNNY. See CHINA (Music).

JINGO is a name for a person who expresses a blustering, warlike attitude. An attitude of militant superiority to people of other nations is often called *jingoism*. The term originated in England in the 1870's. The government, headed by Lord Beaconsfield (Disraeli), was hesitating to interfere in a war between Russia and Turkey. The term *jingo* came from this stanza in a song which was first sung in a London music hall:

We don't want to fight,
But, by jingo, if we do,
We've got the ships,
We've got the men,
We've got the money, too.

The same type of militant spirit was at one time described in the United States as *spread eagleism*. F.F.B.

JINN. See GENII.

JINNAH, MOHAMMED ALI (1876-1948) was called the "founding father of Pakistan." He became the permanent president of the Moslem League of India in 1934, and led the movement for a separate Moslem state in India. This state was created as the Dominion of Pakistan in 1947. The British Crown appointed Jinnah the first Governor-General of Pakistan. He wielded unusual powers in this position, directing the writing of the Pakistan constitution and taking a leading role in decisions of the government.

Jinnah was born in Karachi, India (now in Pakistan). He studied law in England, and in 1906 was appointed advocate, or attorney, of the Bombay High Court. He soon won a reputation as a brilliant lawyer. In his early career he co-operated with Gandhi in efforts toward Hindu-Moslem unity. But in the early 1920's he began to work more and more for Moslem nationalist aims. In his later years he worked as actively against Hindu interests as against British control of India.

JINRIKISHA, *jin RICK shaw*, is a light two-wheeled cart used as a public vehicle in Japan and China. The jinrikisha usually has a top, or hood, to protect passengers from the weather. The runner, or *Hiki*, trots be-

Burton Holmes, Ewing Galloway

The Jinrikisha is the "taxicab" of China and Japan. A good "ricksha" puller can cover a mile in ten minutes. Many of the rickshas used in the Orient are made in New Jersey. "Jinrikisha" is a Japanese word which means "man-powered cart."

tween the shafts and often pulls passengers twenty or thirty miles a day. These men never seem to tire. They earn very little money. The jinrikisha was invented in Yokohama, Japan, in 1869 by an American Baptist minister named Jonathan Goble. The jinrikisha, or *ricksha*, as tourists often call it, has proved a popular and dependable taxicab in the cities of the Orient. But automobiles are beginning to take its place in these countries. After World War II, jinrikishas were declared illegal in many Chinese cities because authorities felt the use of "human horses" was undignified. F.M.R.

JIPIJAPA, *hee pee HAH pah.* See HAT (Hat Materials).

JITTERBUG. See DANCING (Development of the Dance).

JIUJITSU, *joo JIT soo.* See JUJITSU.

JIVARO, *HE vah RO,* is an Indian who belongs to one of the Jivaran tribes found in Ecuador and Peru. The Jivaro are noted for their skill as hunters, and for their habit of preserving the heads of enemies killed in battle.

JOACHIM, *YO ah kim,* **JOSEPH** (1831-1907). See BRAHMS, JOHANNES.

JOAN, *jone,* **OF ARC, SAINT,** is a French national heroine and one of the most popular saints of the Roman Catholic Church. She was a gentle peasant girl who led the soldiers to victory at the siege of Orléans. For this she earned the name of the *Maid of Orléans.*

Jeanne d' Arc was her name in France. She was born at Domrémy, France, in 1412. Her mother kept her at home for the spinning and weaving while her other brothers and sisters went into the fields with their father. Joan was not taught to read and write. But she learned all that her mother could teach her of sacred things. All the village knew her for her gentleness, charity, and holiness. The innocent young maiden had many visions which she believed to be from Heaven. They led her to leave her family and go to the court of King Charles VII of France, who was then uncrowned. Joan presented herself in her humble red peasant clothes to the king, who received her with great ceremony. It was likely that Charles wanted to embarrass her. But she finally convinced him that she was to be the rescuer of France.

From the painting by Nikalo

Young Joan of Arc Prays in the Forest before leading the armies of France to drive the English from the city of Orléans. The French soldiers gladly followed her leadership.

Art Institute of Chicago

Joan of Arc Stands at the Side of Charles VII as he is crowned King of France in the great cathedral at Reims. Joan wanted to return home then, but Charles would not consent.

The Peasant Maid Leads an Army. Charles clothed her in full armor, and gave her sword and banner. Joan of Arc, mounted on a horse, led the French troops into battle. France had been divided against itself for many years. English kings had fought unendingly to capture the French throne, and France had taken sides for and against them. The rough captains and soldiers of King Charles would bow the knee to no one. But they obeyed the commands of Joan of Arc without question. Her courage and enthusiasm inspired them, so that they marched on Orléans and freed the city. They defeated the English in four other battles, and then marched to Reims. There Charles was crowned King of France, and Joan of Arc stood by his side.

The Leader Is Captured. Her mission was ended when the crown was placed upon the head of Charles. She wished to return to the little town of her birth, but

Charles would not consent. The valiant girl did not know victory again. She led an attack on Paris, her armor making her a shining mark for the English arrows. She was badly wounded. The Burgundians, who were French allies of the English, captured her on May 23, 1430. They sold her to the English for 16,000 francs, a sum which then was slightly over $3,000.

The English were not satisfied merely with her capture. They feared her greatly, because the French people admired her so much. She was put into prison for a long time, and suffered many insults. Then Joan was tried as a witch and a heretic. She insisted that her mission had been revealed to her in visions from heaven. The court condemned her to be burned at the stake.

Visual Education Service

Leading Her Victorious Troops, Joan of Arc enters the city of Orléans after the English have been driven from it. Led by Joan, the armies defeated the English four more times.

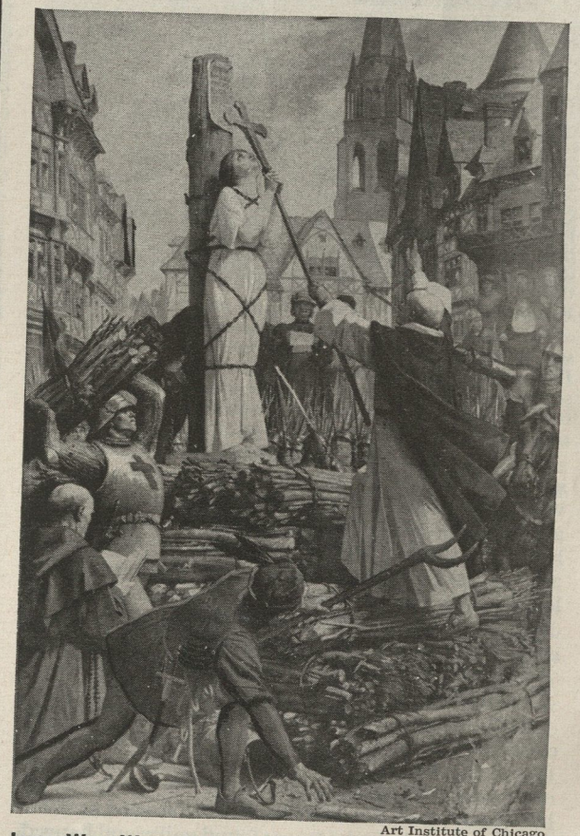
A Martyr's Death waited for Joan of Arc on May 30, 1431. Ten thousand men stood in the market place at Rouen to watch her die. They saw the young Maid of Orléans face her death with high courage, and turn her glance toward the blue sky. Men wept at the dreadful sight. One or two English soldiers tried to laugh. But a secretary of the English king turned from the terrible scene to say, "We are undone; we have burned a saint." The final insult of the English was to refuse to bury her ashes. They were gathered up and thrown into the Seine River.

The young martyr was pronounced innocent of the charges against her in 1456. She was beatified by Pope Pius X in 1909. This was the first step toward making her a saint, or *canonizing* her, in the Roman Catholic Church. In 1919 she was formally declared a saint. Her feast day, celebrated everywhere in France, is May 30.

The Memory of Joan of Arc Lives in many stories of her life. Her appeal to the imagination is great. Historical biographies have been written about her life, as well as many poems, stories, and plays. Schiller and Lomet wrote dramas about her, Balfe wrote an opera, and Mark Twain an historical novel. The English poet Robert Southey wrote a poem, "Joan of Arc," in 1796. George Bernard Shaw wrote a play called *Saint Joan* in 1923.

The cottage in which she was born still stands, kept as a monument to her memory. A copy of a statue of her by Marie d'Orléans stands inside. The spot where the stake stood in the market place in Rouen is also marked by a statue. Another beautiful figure of her is in the Place des Pyramides in Paris. Monuments to her memory are in countless other towns and villages of France. A painting by Bastien Lepage is in the Metropolitan Museum in New York, and the Art Institute of Chicago has a great canvas of her by Boutet de Monvel. A huge statue of the Maid of Orléans was erected on Riverside Drive in New York City in 1915. F.J.S.

See also BATTLES, FIFTEEN DECISIVE (Orléans); BOUTET DE MONVEL, LOUIS MAURICE; CHARLES (VII, France); HUNDRED YEARS' WAR; REIMS.



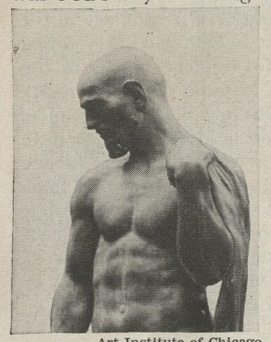
Art Institute of Chicago

Joan Was Wounded and Captured in an Attack on Paris. She was turned over to the English, who condemned her as a witch and burned her at the stake in Rouen's market place.

JOÃO PESSÓA. See BRAZIL (Cities).

JOB. See VOCATIONAL GUIDANCE.

JOB, *johb*, is a figure of Hebrew popular tradition. He is mentioned in Ezekiel 14:14, 20 as famed for his righteousness. Job is best known, however, from the Old Testament book bearing his name. The book is thought to have been written about 400 B.C. His story is told in the Prologue (chapters 1-2) and the Epilogue (chapter 42:7-17). Job was a wealthy sheik who was suddenly overtaken by disaster. He lost his wealth and his family, and then became afflicted with a painful disease. This was God's way of finding out if Job was faithful to Him. Job's three friends, Eliphaz, Bildad, and Zophar, came to comfort him. In the end Job regained his happiness and prosperity.



Art Institute of Chicago

Job was a Biblical character whose patience has become proverbial. This picture is of a sculpture by Zettler.

The Book of Job contains speeches of the Lord (38:1 to 41:25) and of a young person called Elihu (32-37) But its great feature is the dialogue, of which the best part is in chapters 3 to 27. In these chapters Job replies to the advice of his friends.

The author understood human character. His fine use of words and phrasing, and the depth of his thought, place him among the greatest writers and thinkers of all time. Scholars disagree as to whether the book was written by a single man. They also disagree on the explanation of the author's thought.

The Campo Santo in Pisa contains a series of six frescoes representing various periods in the life of Job. They picture Job from the time he was a chieftain in Uz until his return to prosperity. Volterra is believed to have done the sculpture in 1370. For many years Giotto was thought to have been the sculptor. The engravings of William Blake for the book of Job are also famous.

A modern reference to Job's patience is found in the second act of Shakespeare's Henry IV, Part II. There Falstaff says, "I am as poor as Job, my Lord, but not so patient." Today, when a person is disobedient, it is common to say that his actions would "try the patience of Job." W.A.I.

JOB'S DAUGHTERS, INTERNATIONAL ORDER OF, is an organization for girls twelve to twenty years old who are relatives of Master Masons. It seeks to inspire a desire for knowledge, respect for parents, love for home and country, and reverence for the Holy Scriptures. Through its educational fund, the organization lends money to members for vocational training. The order has 1,000 chapters, called *bethels*, with a total membership of more than 100,000. See also MASONRY.

JOB'S-TEARS. See BEAD.

JOCASTA, *joh KAS tah.* See OEDIPUS.

JODL, *YO d'l,* **ALFRED** (1900?-1946), signed the unconditional surrender of Germany at Reims in May, 1945. At that time he was chief of the joint general staff of the German Army, Navy, and Air Force. A few weeks later Jodl was arrested by the Allies and tried at Nürnberg as a war criminal. He was found guilty and hanged.

Jodl had great influence in World War II as personal military adviser to Adolf Hitler. The Fuehrer made him army chief of staff in October, 1942, and promoted him to the rank of colonel general in January, 1944.

Jodl was born in Bavaria and was graduated from the War Academy and General Staff School. He served in World War I. See also WORLD WAR II. G.S.B

JOEL is the name of the second Biblical book of the Minor Prophets. *Joel* means *The Lord is God.* Nothing is known of the life of the prophet named Joel except that he apparently prophesied in Judah. The book was probably written by more than one author, sometime after 300 B.C. Chapter 2 describes how the writer expected the sun and moon to be darkened and the stars to withdraw in the last times. He also foresaw a great outpouring of divine spirit of such nature that young and old alike should prophesy. W.A.I.

JOFFRE, *ZHO fr'*, **JOSEPH JACQUES CÉSAIRE** (1852-1931), commanded the French armies for the first two years of World War I. He was later named a marshal of France, and was a leading military adviser to his government.

Joffre's parents were working people of Rivesaltes, in the eastern Pyrenees. They sent him to Paris when he was fifteen to prepare for the Polytechnic, the great military school of France.

Joffre entered the Polytechnic in 1869, but had to leave a year later to serve in the army in the Franco-Prussian War. He resumed his studies after France's defeat, and was graduated in two years. Joffre entered the corps of engineers with a commission as a lieutenant. There he began his slow but steady rise. "Method is the mother of great achievement," was his favorite saying. To method he added untiring energy and great honesty of purpose. His promotions came slowly but they always came through merit.

Brown Bros.

Joseph Joffre, French General who stopped the German drive on Paris in 1914

In September, 1914, the Germans had almost reached the gates of Paris. But Joffre stopped their advance at the Battle of the Marne, and won the confidence of the French people. His soldiers called him "Papa Joffre," because of his interest in their welfare and the assurance his calm presence always gave them. The French Government removed him from command in 1916 because it thought he was too cautious. But the poor results of his more aggressive successor, General Robert Georges Nivelle, proved the wisdom of Joffre's strategy of "nibbling."

The general headed the French military mission to the United States in 1917. In December, 1918, he was elected one of the "forty immortals" in the French Academy. A.M.

JOHANAN BEN ZAKKAI, *joh HAN an ben ZAK ay,* was a Jewish teacher in Palestine who lived during the first hundred years after the time of Christ. After the Jewish Temple was destroyed by the Romans, he helped to preserve Jewish law and religion, and to restore Jewish national life. The school at Jabneh which he founded with the permission of Emperor Vespasian became the center of Jewish culture. I.J.R.

JOHANNESBURG, *yo HAHN es burg* (pop. about 603,000), is a city built by gold. It is situated in the middle of the Witwatersrand, one of the world's great gold-producing ranges, and is the most important city in South Africa. Johannesburg is in the province of Transvaal, in the Union of South Africa. It lies 5,770 feet above sea level on the southern slope of the Rand. The city has gold mines just outside the business district.

Johannesburg is a great modern city, with tall buildings, busy streets, hotels, parks, and residential suburbs. It has varied industries, and is a financial center for the farm lands near by. The city is connected by railway with Cape Town, Port Elizabeth, and Durban. About half the people are Bantus.

Johannesburg was founded in 1886, after gold was discovered there. It was captured by British troops during the Boer War. R.PEA.

See also BOER WAR; UNION OF SOUTH AFRICA.

JOHN was the name of twenty-three Popes of the Roman Catholic Church who ruled between A.D. 523 and 1415.

John I was Pope from 523 to 526, following Hormisdas. He was compelled by King Theodoric of Italy to lead an embassy of Roman senators to Emperor Justin I at Constantinople. His mission concerned an imperial edict against the Arians, an heretical body in the Church. It had results highly displeasing to Theodoric, who favored the Arian heresy. On his return, John was imprisoned by Theodoric and soon died. The Catholic Church honors him as a saint.

John XII was Pope from 955 to 964. He was elected when only eighteen. In 962 he crowned Otto I as Emperor of the Romans (see HOLY ROMAN EMPIRE). John was deposed by a synod convened by Otto in 963, but returned later and displaced Leo VIII (antipope), who had been set up in his place.

John XIX was Pope from 1024 to 1033, succeeding his brother, Benedict VIII. The Pope belonged to the Roman family of the Counts of Tusculum. He crowned Emperor Conrad II.

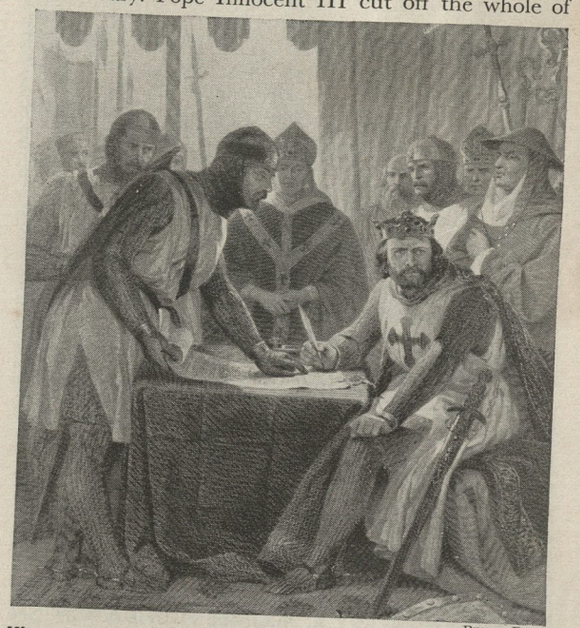
John XXII (Jacques d'Euse) was Pope from 1316 to 1334. He was a learned theologian and also skilled in medicine. The Pope was successful in spreading the faith, and he collected large sums of money for the Church. However, he lived very simply. He excommunicated Louis of Bavaria and favored Robert, king of Naples. Louis had himself crowned emperor and set up an antipope who soon gave up his claim to the see of Rome. John governed the affairs of the Church from Avignon.

John XXIII (Baldassare Cossa) was Pope from 1410 to 1415. He came of a noble Neapolitan family. John called the Council of Constance, which urged him to abdicate. After promising to do so, he fled, but was imprisoned. The Council then formally deposed him, and he accepted the decision. After four years he was freed and named a cardinal of the Sacred College by Pope Martin V. F.J.S.

JOHN (about 1167?-1216) was one of England's worst kings. His rule was so bad that his barons rose up against him. They forced him to sign the *Magna Charta*, the foundation of English liberty. John was the youngest son of Henry II, of the Plantagenet line. His father called him *Lackland*, probably because there was nothing left for John when his father divided up his lands among his other sons.

John early showed his weakness as a ruler. His administration as governor of Ireland in 1185 was so bad that he had to be recalled to England. He became king in 1199 after the death of his brother Richard. He began almost at once to make mistakes which greatly changed English history. First, he broke the feudal laws in his French domains to such an extent that the French king Philip Augustus declared war on him. John met total defeat in 1205, and lost all his French holdings except Aquitaine.

In the same year, he quarreled with the Pope about the appointment of Stephen Langton as Archbishop of Canterbury. Pope Innocent III cut off the whole of England from the Church, and issued a papal bull deposing John. But John gave in to the Pope before the bull was delivered, and handed over all England to the Pope as a feudal fief. John was allowed to continue as king, but had to pay an annual tribute to the Pope.



Brown Bros.

King John of England signing the Magna Charta in 1215. The king was so disliked by his nobles that they forced him to sign the document. The Magna Charta took away much of the king's power and laid the foundation of democracy.

In 1214, John tried to get back his lost French lands, but was soundly defeated. This last setback caused his barons to revolt against him. They forced him to sign the *Magna Charta*, or *Great Charter*, on June 15, 1215, at Runnymede, a meadow on the bank of the Thames. John was able to get the Pope to declare the Charter illegal. He raised an army and commenced war on the barons. The barons asked the French Crown Prince Louis to help, and made him king of England in 1216. The struggle had not been decided when John died. But the Magna Charta remained in effect, the first great step in the development of English democracy. P.V.B.J.

See also INNOCENT (III); MAGNA CHARTA; PHILIP (II, France); RICHARD (I, England).

JOHN III SOBIESKI, *so BYES ke* (1624-1696), was a king of Poland, who is sometimes called *the savior of*

Vienna. He was a member of a famous Polish military family, and became one of Poland's greatest heroes.

John gained fame for his victory over the Turks in 1673. He was elected King the following year, after the death of King Michael Wisniowiecki. He worked hard to form a Christian alliance against the Turks. In 1683 he was supreme commander of the Allied army that defeated the Turkish forces which were besieging Vienna.

The last years of John's reign were clouded with military defeats, and by his failure to restore the unity of the Polish Commonwealth so that it could defend itself against its powerful neighbors. H.H.F.

JOHN VI (1769 or 1767?-1826) was king of Portugal from 1816 to 1826. He took power as regent in 1792 when his mother, Maria I, became insane.

Napoleon's armies threatened Portugal in 1807, and John fled with his court to the Portuguese colony of Brazil. There he introduced many reforms. But the Portuguese revolted and forced him to return to Portugal in 1821. His son declared Brazil independent and became Emperor Pedro I in 1822. G.S.B.

JOHN, EPISTLES OF. Saint John the Evangelist is believed to be the author of these three Epistles of the New Testament. The Epistles, or letters, were written within 100 years after the birth of Christ. The first Epistle, the longest, explained Christian doctrine to the faithful in Asia Minor. It speaks of heresies which had arisen, and emphasizes the divinity of Christ. Some authorities think it was written as a letter to accompany the Gospel of John. The second Epistle praises the Christians and warns against false teachers. The third describes certain features of early Church life. See also GOSPEL; JOHN THE EVANGELIST SAINT. F.J.S.

JOHN, GOSPEL OF. See GOSPELS.

JOHN, KNIGHTS OF SAINT. See KNIGHTS OF SAINT JOHN.

JOHN AND MARY R. MARKLE FOUNDATION. See EDUCATIONAL FOUNDATIONS AND ENDOWMENTS.

JOHN BROWN'S BODY. See BROWN, JOHN.

JOHN BROWN'S RAID. See BROWN, JOHN.

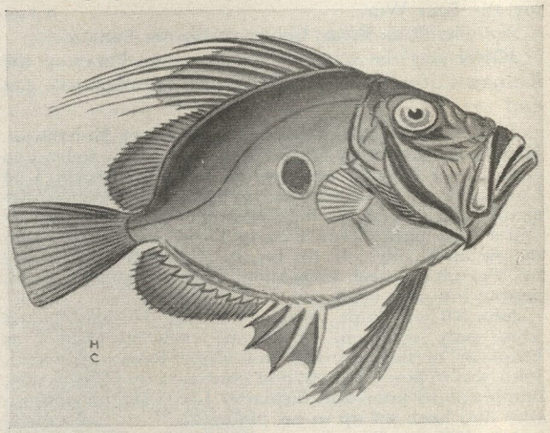
"John Bull" is a symbol of the English people.

JOHN B. STETSON UNIVERSITY is a privately controlled coeducational school at DeLand, Fla. It has colleges of liberal arts, law, and music. Courses offered lead to the B.A., B.S., LL.B., A.M., and B.M. degrees. Stetson was founded in 1883, and has an average enrollment of 900. W.S.A.

JOHN BULL is the name popularly used to typify England and the English people, just as *Uncle Sam* typifies the United States and its people. It was first used by the witty Scottish doctor and writer, John Arbuthnot, in *The History of John Bull*, published in 1727. In this book John Bull, representing England, appears as a jolly, honest, plain-dealing, hot-tempered farmer. Arbuthnot's word-picture was later reproduced in a drawing by Sir Francis Carruthers Gould. The name and the picture, through long use, have grown familiar to all. John Bull always wears a "tile" hat and a swallow-tailed coat. His trousers are tucked into boots, and the outlines of the British flag appear across his waistcoat. See also UNCLE SAM. M.F.L.

JOHN CARROLL UNIVERSITY is a liberal arts and science college for men at University Heights, Cleveland, Ohio. The summer, late afternoon, and evening sessions of the school are coeducational. John Carroll is controlled by the Roman Catholic Church and is conducted by the Jesuits. Courses lead to A.B., Ph.B., B.S., M.A., and M.S. degrees. The university was founded in 1886, and has a normal enrollment of about 600.

JOHN DORY is the name of a fish which lives in warm seas. It is thinner than the bass and has long, ribbonlike projections from its dorsal fins. Each fish has



The Odd-Looking John Dory is found in large numbers in shallow bays along the coasts of southern Europe, Japan, and Australia. The dory of America is a different species.

a round black spot on the middle of its side. A legend says this spot is a thumbmark left there when Saint Peter took a coin from the fish's mouth. L.P.Sc.

Classification. The John Dory of European seas is classed as *Zeus faber*. John Dorys are in the *Zeidae* family.

JOHN MARTIN DAM is a Federal flood control project on the Arkansas River about twenty miles upstream from Lamar, Colo. It is a concrete and earth-filled structure, about 130 feet high and more than two and one-half miles long. It has storage space for 270,000 acre-feet of water for flood control and about 385,000 acre-feet of water for irrigation. See also DAM.

JOHNNIE CRAPAUD, *KRAH PO*, is a name sometimes used to personify the French nation, much as *John Bull* is used to mean England, and *Uncle Sam* to mean the United States.

JOHNNY APPLESEED. See CHAPMAN, JOHN.

JOHN OF GAUNT, *gawnt*, or *gahnt* (1340-1399), DUKE OF LANCASTER, actively supported the policies of his nephew King Richard II, "the Black Prince" of England. He fought under his nephew in the French wars for nearly ten years. Later he also took part in the war against Scotland. The duke was a friend of the poet

Geoffrey Chaucer, and supported John Wycliffe in his efforts to reform the English clergy.

Gaunt was born in Ghent, Belgium, from which he got his name. He became Duke of Lancaster after his wife Blanche of Lancaster died in 1362. His marriage with Constance of Castile in 1372 made him assume the title of king of Castile. He gave this up when his daughter Catherine married John of Castile in 1387. He was named Duke of Aquitaine in 1390, but lost his claim three years later. His son was Henry IV of England. Shakespeare used John of Gaunt as a leading character in the play Richard II. P.KN.

See also LANCASTER.

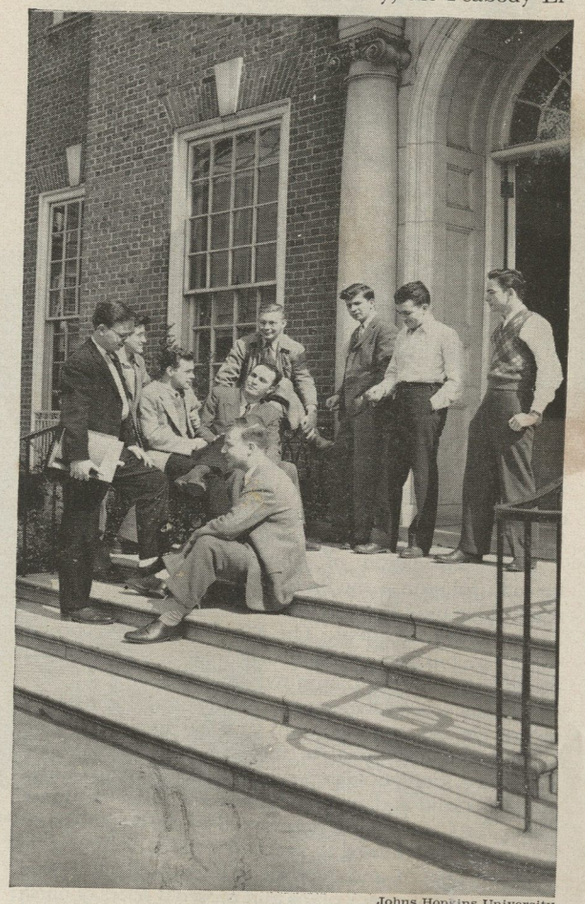
Brown Bros.

John of Gaunt founded the House of Lancaster which ruled in England from 1399 to 1461.

JOHNS HOPKINS UNIVERSITY is a famous school at Baltimore. It has several undergraduate schools for men only, but its graduate schools are coeducational. For the most part, the university is privately endowed. All the schools, except the school of medicine and the school of hygiene and public health, are on a suburban campus. The schools of medicine and hygiene and public health are near Johns Hopkins Hospital in the city of Baltimore. The university has a working arrangement with the Maryland Institute and the Peabody Conservatory of Music. The following divisions are included in the university: the School of Higher Studies of the Faculty of Philosophy, the College of Arts and Sciences, the School of Medicine, the College for Teachers, the School of Engineering, the School of Hygiene and Public Health, the School of Business Economics, and the Walter Hines Page School of International Relations. A night division offers courses for technical workers.

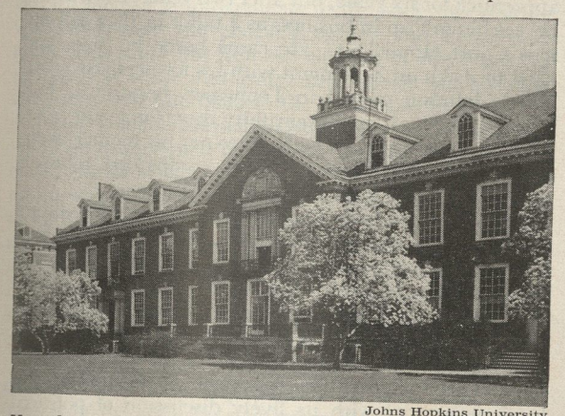
Undergraduate students may enroll in the College of Arts and Sciences, the School of Engineering, and the School of Business Economics. Premedical and prelaw courses are offered, as well as training for teaching, engineering, business, scientific research, journalism and writing, and government services.

The university libraries contain over 600,000 books and publications. The students also have access to the William H. Welch Medical Library, the Peabody Library, the Enoch Pratt Free Library, and the Maryland Historical Society collection.



Johns Hopkins University

Students of Johns Hopkins University, in Baltimore, waiting for lunch to be served inside the Memorial Dormitory



Johns Hopkins University

Maryland Hall at Johns Hopkins University is part of the school's famous engineering college. It is situated on the campus of the university near the city of Baltimore.

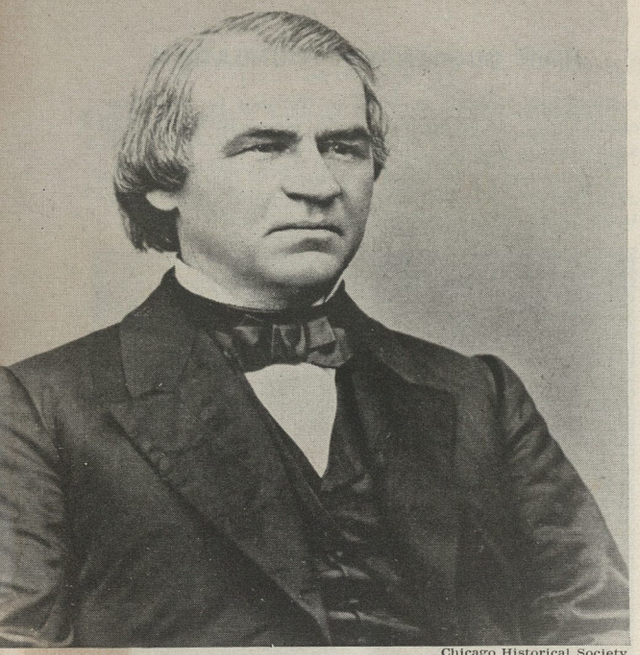
Johns Hopkins maintains an appointment bureau where present and former students can obtain the university's assistance in finding permanent or part time employment, or vacation work. In the field of extracurricular activities the students have clubs in journalism, dramatics, music, debating, and photography. A full schedule of sports is maintained.

A gift from Johns Hopkins, a Baltimore merchant, made possible the founding of the university in 1867. It has an average enrollment of about 1,765. W.F.L.

See also HOPKINS, JOHNS.

JOHN OF THE CROSS, SAINT. See MYSTICISM.

JOHN SIMON GUGGENHEIM MEMORIAL FOUNDATION. See EDUCATIONAL FOUNDATIONS AND ENDOWMENTS; GUGGENHEIM MEMORIAL FOUNDATION.



Chicago Historical Society

Andrew Johnson

17TH PRESIDENT OF THE UNITED STATES, 1865-1869

JOHNSON, ANDREW (1808-1875), was the seventeenth President of the United States. He was the third Vice-President to step into the office because of the death of a President. Vice-Presidents who become Presidents in this way are called "accidental Presidents."

The assassination of Abraham Lincoln in 1865 brought Johnson to the Presidency. He had to deal with some of the most difficult problems that have ever faced an American President. The War between the States was over, but the problem of bringing the Southern States back into the Union remained.

Johnson was a Democrat, a Southerner, and a slaveowner. He had strong sympathy for the South, although he had remained loyal to the Union when his state, Tennessee, seceded. He tried to carry through Lincoln's plan for a kind and generous treatment of the Southern States. But Congress was dominated by the Republicans. They were determined to keep their party in control, to punish the South, and to profit by the war. They refused to carry out Johnson's plans and passed a series of harsh laws over his veto.

Johnson's enemies in Congress tried to remove him from office by impeaching him. If they had succeeded, they might have changed the entire system of government of the United States. The President might have become a mere figurehead, with no real power.

Johnson was a typical man of the frontier. He worked his way up from very humble beginnings. He began as a tailor's apprentice, and had no formal schooling. But he rose to the vice-presidency through a career as state representative, governor, and United States Senator.

Johnson was honest, brave, and very intelligent. But he had the touchy pride of the self-made man. He was reserved and found it hard to seek or accept advice. Once he had made up his mind, he stood firm. He was tender-hearted, but he had neither tact nor a sense of humor. He lacked Lincoln's skill in getting men of opposing views to work together.

Johnson's misfortune was that he became President at a time when the qualities he lacked were greatly needed. His fine traits were not appreciated until after his administration was over. But he lived to see the American people realize that he had been treated very unjustly. They saw the effect of the harsh program Congress imposed on the South in place of Johnson's mild program of reconstruction. Abuses begun then were not corrected for many years, and the financial interests of the North took control of the country.

Early Life

Andrew Johnson was born at Raleigh, N.C., on December 29, 1808. His father, Jacob Johnson, was a handyman in a tavern. His mother, Mary (Polly) McDonough Johnson, was a maid in the tavern. Andrew was the younger of two sons. His father died when he was only three years old, and his mother supported her children by taking in washing and sewing. The Johnsons were very poor, and they continued to be poor even after Mrs. Johnson had married again. She could not afford to send Andrew to school.

When he was fourteen years old, Andrew was apprenticed to a tailor. He was supposed to serve as apprentice for six years, but after two years he ran away. He set himself up in business as a tailor in 1824 at Laurens Court House, S.C. He came home in 1825, and tried to reach an agreement with his former master, but failed. Johnson moved to Tennessee, because he had heard there was more opportunity there for a poor man. In 1826 he returned to Raleigh to get his mother, stepfather, and older brother. They accompanied Johnson to Greeneville, a town in eastern Tennessee.

Education and Early Career. Johnson opened a tailor's shop and very quickly grew busy at his trade. He had learned to read as an apprentice, probably from the shop foreman. It was the custom at that time for tailors to employ someone to read to the workmen as they sat cross-legged on their tables, stitching clothes. Johnson's first reading matter was only what the tailor shop had to offer. This included the American Constitution, the local newspaper with its lively discussion of political questions, and, once in a while, a book of history or poetry.

After Johnson came to Tennessee, his education went ahead more quickly. He married Eliza McCardle, a beautiful and intelligent girl of Greeneville, within a year after his arrival. She taught him to write and to do simple sums in arithmetic. She also encouraged him to read widely and to study. In order to train himself as a speaker, Johnson walked four miles once a week to take part in debates held by the students of two colleges in the neighborhood. His tailor's shop soon became the meeting place of townspeople who wanted to discuss public affairs. Meanwhile his business prospered. He bought land and became a slaveowner.

Political and Public Activities

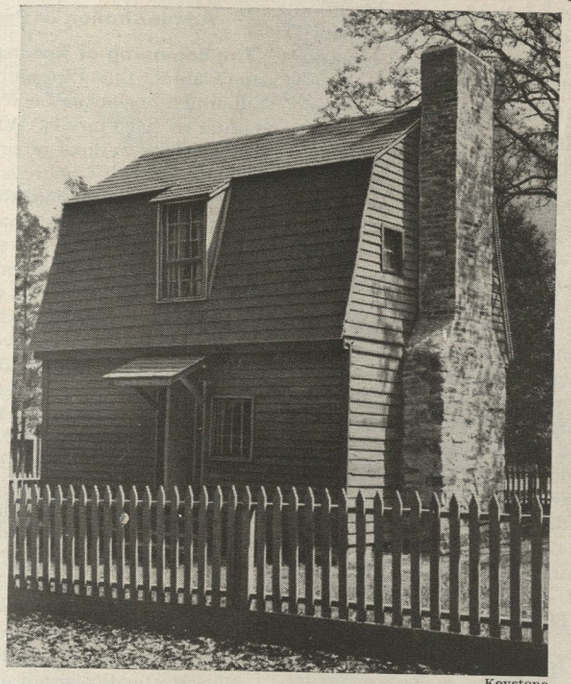
Political Career. In Johnson's time, Tennessee was ruled by a small group of great landowners. These men controlled the local government of Greeneville, although the eastern part of the state had been settled chiefly by small farmers. When Johnson was only twenty-one, he decided to challenge the power of the rich landowners. He declared himself a candidate for alderman in 1829, and was elected.

From this time on, he spent most of his time in public office, rising from local to state and national posts. After three terms as alderman, he was elected mayor of Greeneville. In 1835 he was sent to the Tennessee House of Representatives. Johnson was a loyal Jacksonian Democrat in politics. He opposed a bill for internal improvements in the state, because he wanted to save the people's money and to prevent graft. This stand lost him the election of 1837. But his prophecy of waste and graft came true so quickly that the voters sent him back to the legislature in 1839.

Johnson made himself more widely known in 1840 when he campaigned for Martin Van Buren as Democratic elector-at-large. In those days an election campaign was an important source of entertainment in the more thinly settled parts of the country. Andrew Johnson learned to sway large crowds with his powerful voice and homely arguments. His appearance was striking. He was of medium height and had powerful shoulders, stubby legs, and a large head. He had brilliant black eyes, rugged features, and a mass of black hair.

Johnson was elected to the state senate in 1841. He made himself very unpopular with the large landowners of the state by suggesting that only the white people should be counted in determining the number of representatives a district could have. This would have given less power to the landowners who also owned many slaves, for five slaves were counted as three white men in determining representation.

Johnson in Congress. Johnson was elected to the United States House of Representatives in 1843. By this time he had become the recognized political leader of eastern Tennessee. Johnson was conscious and proud of his humble origin. He kept to himself in Washington and avoided the aristocrats who represented the Southern States at that time. The other Southern leaders had marked him down as not "pure" on the slavery question, because of the suggestion he had made in the Tennessee senate.



Keystone

Birthplace of Andrew Johnson. In this humble house at Raleigh, N.C., the 17th President of the United States was born.

But Johnson's stand on slavery was not consistent. In Congress he voted for the admission of Oregon and California as free states, but approved the entrance of Texas as a slave state. He supported the Lecompton Constitution of the proslavery group in Kansas.

Johnson believed that slavery had to be defended because the Constitution sanctioned it. He himself owned eight slaves. But for almost twenty years he urged the passage of a Homestead Bill. This bill would have thrown open Federal lands to poor white settlers, and would have destroyed slavery. Johnson opposed the political power of the great slaveowners. But he thought the agitation against slavery was a threat to the safety of the Union.

Johnson held independent views on some subjects. He favored higher taxation of the rich and defended the rights of workmen and poor farmers. But he stood with the Democrats in fighting high tariffs and internal improvements.

Johnson as Governor. In 1853, Johnson's district in Tennessee was rearranged by his opponents in the state legislature in such a way that the Whigs had a majority. Johnson knew he would be defeated if he ran again for representative. Instead, he announced he would be candidate for governor of the state. He won easily. As governor, Johnson favored laws to provide free public education. He fought the use of prison labor in competition with free white labor, but without success.

In 1855 Johnson sought re-election as governor of Tennessee. He was opposed not only by the Whigs, but also by the Know-Nothing Party, a secret political order hostile to foreigners, Catholics, and Masons. Johnson was a Mason, and he hated all kinds of religious persecution. At one public meeting, he was threatened with assassination. But he faced a large unfriendly audi-

ence without a bodyguard, fingering his pistol and challenging anyone to attack him. Johnson was reelected governor.

Return to National Politics. Johnson returned to Washington in 1857 as United States Senator from Tennessee. In the Senate he worked to push through the Homestead Bill. It was finally passed in 1862, after the War between the States had begun and the southern representatives had withdrawn.

As the slavery question became more critical, Johnson continued to take a middle course. He regretted the political power of the slaveowners. But he opposed antislavery agitation because it threatened the Union. Johnson's stand in favor of both the Union and of slavery suggested that he would be a good compromise candidate for President in 1860. Tennessee voted for him in the Democratic convention of that year, but Johnson withdrew his name and gave his support to John C. Breckinridge.

Johnson's Stand in the War. Johnson believed until almost the last minute that the South would not really secede. As events moved toward a final break, he strongly defended the Union. On December 18, 1860, he made a powerful speech in the Senate, pleading for unity. He argued that the Constitution allowed for whatever changes the discontented Southerners might want to make. As the southern states started to secede, Johnson stood by his principles. He was conspicuous, later, as the only southern member of Congress who refused to secede with his state.

On March 2, 1861, he denounced the secessionists before the Senate, and threatened them with the death penalty for treason. This outburst aroused so much fury in the South that Johnson's train was besieged by mobs again and again on his return to Tennessee. Although the personal risk was great, he conducted a campaign in opposition to Governor Harris, who wished to lead the state out of the Union.

Eastern Tennessee supported Johnson, but the state seceded in June. Johnson had to leave for Washington, and remarked that he was "a fugitive from tyranny."

Military Governor of Tennessee. In 1862, part of Tennessee was freed by the Union armies. Lincoln appointed Johnson military governor of the state. Johnson planned to win back the rebel sympathizers by a generous policy. But the task was difficult. Johnson had to wait until the Union armies had won more victories before he could carry through his plans. He wanted to allow free elections for the voters in Tennessee who would take an oath against the rebellion and accept the Emancipation Proclamation, provided those voters had not supported the Confederacy. He had so far succeeded by March, 1864, that Tennessee prepared to send representatives to Congress.

Election as Vice-President. Johnson's devotion to the Union and his record as military governor made him a national figure. He was the most prominent of the *War Democrats*, or loyal wing of the Democratic party. The Republicans and War Democrats supported Lincoln for a second term, and named Johnson as candidate for Vice-President. For this campaign, the two parties combined under the banner of the Union Party.

Lincoln and Johnson were elected, and were inaugurated on March 4, 1865. Johnson had just recovered from an attack of typhoid fever, but Lincoln insisted that he take part in the ceremonies. To strengthen himself for the occasion, Johnson took a drink or two. In his weakened condition, the alcohol made him tipsy. His speech was jumbled and his appearance undignified. His enemies seized on this incident to claim that he was a drunkard. This accusation was never proved.

Six weeks after the inauguration, on April 15, 1865, Lincoln was assassinated. Johnson became President just as the War between the States came to an end.

Administration as President (1865-1869)

The Beginning of Reconstruction. Johnson kept the same Cabinet that Lincoln had appointed. It included William H. Seward as Secretary of State and Edwin M. Stanton as Secretary of War. Johnson was first faced with the long task of reconstruction. In this he came into conflict with Congress. The Congressmen who opposed him were on doubtful legal ground. They had fought a war to prove that no state could leave the Union. But once the war was won, they claimed that the seceding states were outside the Union and could come back only on terms dictated by Congress. They thundered for months and years about punishing the South. But the real motives of the Congressmen who fought Johnson were made clear later. They wanted to cling to the power they had won as a political party, and they wanted to give northern business interests a free hand.

For years the representatives of northern business had struggled to put through laws that were favorable to manufacturing and industrial interests. They had been blocked at every turn by the southern politicians who represented agricultural interests. When Johnson took office, the Republicans in Congress were dominated by a group called the Radicals. They knew that if former southern leaders returned to Congress, the Republicans would be hopelessly outnumbered.

The Radicals wanted a protective tariff, a national banking system, the repayment of the war debt in gold, and government aid to transcontinental railroads. The foundations for such a program had been laid during the war years in a Congress with a Republican majority. But it was well known that Johnson was a Democrat who strongly supported states' rights. All his life he had opposed large economic interests, even in the South. The Radicals realized that President Johnson would try to block their plans for postwar industrial expansion.

Problems of the Times. After taking the oath of office, Johnson proceeded with reconstruction under his own authority, just as Lincoln had planned. On May 29, 1865, he issued a Proclamation of Amnesty and Reconstruction. This order offered to restore the southern states to the Union. They were to remain under control of their white citizens who renounced the rebellion.

But when Congress met again in the fall, it became clear that the Radical Republicans, led by Thaddeus Stevens and Charles Sumner, had much sterner measures in mind. A Joint Committee of Fifteen from the two houses was created to decide whether representatives from the southern states could be admitted. Plans went forward to punish all the Confederate leaders, give the

vote to the Negroes, and place the South under military rule.

Johnson did not approve of this program. He wished to be generous to all the former rebels except the most outstanding Southern radicals and military men. He felt that a long period of military occupation would keep alive the hatreds of war. Johnson also thought that the individual states should decide the question of Negro suffrage, as they did in the North.

Break between Congress and the President. The first open break between Johnson and Congress came in February, 1866. The President made a speech on Washington's birthday in which he called the Radicals "disunionists" and said that their reconstruction bills were "legal monstrosities."

Congress pushed through a whole series of bills which Johnson vetoed regularly, and which were regularly passed over his veto. The first was the Freedmen's Bureau Bill, set up to give temporary economic relief to former slaves, who were left with no means of support. Johnson vetoed the bill because it had been passed by a Congress in which the Southern States were not represented. Another Congressional measure, the Civil Rights Bill, made the freedmen citizens. Its real purpose was to nullify a series of laws, called the *Black Codes*, which had been passed in the Southern States. The Black Codes practically made the Negroes slaves again. Johnson opposed the Civil Rights Bill because he felt that it interfered with the rights of the states.

In June, 1866, Congress passed the Fourteenth Amendment to the Constitution. This amendment was designed to protect the civil rights of the Negroes, to bar former rebels from holding office or voting until 1870, to restrict representation in Congress in accordance with the number of voters, and to declare the Confederate debt null and void. Johnson objected particularly to the clause which forbade former rebels to hold office. He could not see where the South could find leaders to work out its problems if this source of leadership was cut off.

The Congressmen who drew up the Fourteenth Amendment were not thinking of slaves alone when they inserted a clause which forbade the states to pass laws "to deprive any person of life, liberty, or property without due process of law." This clause was also designed to protect big business. The Supreme Court later interpreted the clause to mean that the states could not pass laws which limited rights of large corporations. One of the Radical Republicans who favored the Fourteenth Amendment called it "the Magna Charta of accumulated wealth and capital." Johnson opposed the amendment, but it was ratified by the necessary number of states and went into effect on July 28, 1868.

Johnson decided to present his point of view to the people before the Congressional elections of 1866. He went on a speaking tour, but this tour was not a success. The Radicals heckled Johnson, and in some cities riots were arranged ahead of time to embarrass and ridicule him. Johnson did not bring the economic issues into the open, although he himself saw them clearly. If he had done so, he might have won more support among the moderate Republicans. The Radicals won a victory in the elections of 1866. This victory gave Johnson's opponents the signal to go ahead with their program.

Attempt to Remove Stanton. The struggle between Congress and the Chief Executive came swiftly to a climax. The Stevens Reconstruction Bill divided the South into five military districts and imposed strict army rule. The bill provided for the organization of state governments under Federal supervision. It also provided that the states could not send representatives to Congress until they approved the Fourteenth Amendment. The bill was passed over the President's veto.

After the Radicals had disposed of the South, they turned on the President, pushing through the Tenure of Office Act. This law forbade the Chief Executive to remove, without the Senate's approval, any official whose appointment had been confirmed by the Senate. Johnson resisted this attempt to destroy the President's power to appoint and dismiss his own assistants. On August 2, 1867, he dismissed Secretary of War Edwin M. Stanton, who was plotting with the Radicals, and named General Ulysses S. Grant as Secretary.

The Radical Congressmen tried to influence Grant against the President. In January, 1868, the General broke with Johnson publicly and surrendered his office to Stanton. Stanton was removed again by the President, and General Lorenzo Thomas was appointed Secretary of War. But Stanton shut himself up in his office and refused to let General Thomas take possession. The Senate declared that Johnson had acted illegally in removing Stanton without its approval. On February 25, 1868, the House of Representatives passed a resolution impeaching the President.

The Impeachment Proceedings. There were eleven charges in the articles of impeachment. The most important were the first, which charged that the President had broken the Tenure of Office Act, and the eleventh, which claimed that the President had committed various offenses in his attacks on Congress.

On March 5, 1868, the Senate organized itself into a court to hear the impeachment case. Johnson did not appear at the trial. He was ably defended by William Evarts of New York. The Radical orators waded "knee deep in words, words, words" in support of their ridiculous accusations. The country grew impatient as the trial wore on. A vote on the eleventh charge was taken on May 16. Thirty-five senators voted to convict Johnson, and nineteen to acquit him. The Radicals lacked one vote of the two-thirds necessary for conviction. Ten days later a vote on two other charges showed the same result. No further votes were taken.

Foreign Relations. At home Johnson had been able to accomplish nothing. But in foreign affairs Secretary of State Seward carried through two important achievements. During the War between the States, Napoleon III of France sent an army to Mexico to overthrow the Mexican Government. He placed Maximilian of Austria on the throne as Emperor of Mexico. This was a violation of the Monroe Doctrine, but while war was going on in the United States, the State Department could do no more than protest. In 1865, however, Federal troops were sent to the Mexican border. Seward informed Napoleon's ambassador that the United States Army was ready to drive the French out by force if necessary. Napoleon did not wish to become involved in a war with the United States. In 1867 he withdrew

the last of his troops from Mexico. Maximilian was left behind to face a firing squad.

The other important accomplishment in foreign relations was the purchase of Alaska from Russia in 1867. The Russians were afraid they might lose the colony to Great Britain in some future war. So they offered to sell Alaska to the United States for $7,200,000. Seward easily won the approval of the Senate, but the House of Representatives was not very enthusiastic. Finally the Secretary of State won over enough Congressmen to gain a majority vote. But for years many people referred to the purchase of Alaska as "Seward's folly." No one dreamed how important the possession of Alaska would some day prove.

End of Johnson's Administration. The last months of Johnson's term were not eventful. He hoped the Democratic party would nominate him as their candidate for the Presidency in 1868. He wanted to justify his stand against Congress. But the Democrats chose Horatio Seymour, a sound-money Democrat from New York, to run against Grant, the Republican nominee. Grant would have lost the election had it not been for the Negro vote in the South. The Republican congressmen had foreseen this when they urged votes for Negroes.

As Johnson's administration drew to a close, he won more and more respect for the honorable way in which he faced Congress. His last official receptions were attended by large crowds, including many of his political enemies. His last important official act was the proclamation, on Christmas Day, 1868, of complete pardon to all who had been concerned in the secession.

Mistress of the White House. Eliza McCardle Johnson was an invalid. Her daughter, the wife of Senator Patterson, acted as White House hostess. The mansion was a livelier place during this administration than it was during the War between the States.

Later Life

After leaving the White House, Johnson made several unsuccessful attempts to run for Congress. Elected to the Senate in 1874, he attended a special short session in March, 1875, and delivered a speech attacking Grant and defending the Constitution. After Congress adjourned, Johnson returned home. Soon afterward he had a paralytic stroke and died at his daughter's plantation in Tennessee. He was buried at Greeneville, Tenn., his old home. Great crowds came to pay their respects to the stubborn old fighter, the most unjustly attacked of all American Presidents.

Eliza McCardle Johnson (1810-1876), the wife of Andrew Johnson, was a great help to him throughout his career. But she avoided public appearances, and stayed in the background when Johnson first began to attract attention in politics. After Johnson became President, ill health forced her to live in seclusion, and to give up many of her duties as White House hostess.

Eliza McCardle was born in Leesburg, Tenn., in 1810. She grew up to be an extremely attractive young woman. She was barely seventeen when she married nineteen-year-old Andrew Johnson. But both of them were unusually mature for their ages. Johnson's wife was much better educated than he was and she urged him to strive toward self-improvement.

As an office-holder, Johnson had to remain away from home for long periods. His wife devoted herself to the care of their five children. She also looked after his personal affairs, collecting rents and managing the real estate that made up their slender personal fortune. She had a mild and affectionate nature, and could always soothe Johnson's stormy rages by placing her hand on his shoulder and saying gently, "Andrew, Andrew."

The White House became livelier during the Johnson administration than it had been during the gloomy war years. The White House family included the two younger sons, two daughters (Mrs. Stover and Mrs. Patterson), Judge D. T. Patterson, and the President's five grandchildren. Mrs. Patterson acted as mistress of the White House because of her mother's illness. She was dignified, charming, and gracious. Eliza McCardle Johnson died at her daughter's home in Tennessee in 1876, six months after the death of her husband. H.J. and M.Jos.

Related Subjects. The reader is referred to:

Impeachment
Maximilian
Reconstruction
Seward, William Henry
Stanton, Edwin McMasters
Tenure of Office Act

An Outline suitable for the life of President Johnson will be found with the article "President of the United States."

Questions

Why was Johnson's Presidency an unusually difficult one?

How did Johnson learn to read and write? What kind of a boyhood did he have?

What act of Johnson made him unpopular with landowners in Tennessee?

In what ways were Johnson's attitudes toward slavery inconsistent? How did the Southerners feel toward Johnson? Why?

Why did Johnson decide to run for governor instead of representative in 1853?

What did Johnson do when his state seceded? What was unusual about his action?

Why was Johnson chosen for the Vice-Presidential nomination in 1854?

Why did northern Republicans object to Johnson's plans for the South after the war?

Why didn't Johnson favor military occupation of the South?

Was the Fourteenth Amendment set up only to aid the Negroes? What did it accomplish?

What were the chief charges on which Johnson's enemies tried to impeach him?

What was "Seward's Folly"? Why was this not a good name for Johnson's purchase?

What part did the United States play in Mexican affairs in 1867?

What was Johnson's last important act as President?

In what ways did Eliza McCardle prove to be a good wife for Andrew Johnson?

JOHNSON, "BAN," BYRAN BANCROFT (1864-1931). See AMERICAN BASEBALL LEAGUE.

JOHNSON, EDWARD (1881?-), was the first singer to become general manager of the Metropolitan Opera Company in New York City. After his appointment in 1935, he continued to make opera popular. He continued the weekly radio broadcasts of operas and broke away from the tradition of hiring mainly foreign singers. Johnson also proved to have great ability in business. In 1940, when the Metropolitan faced a serious financial crisis, his appeal for public funds helped to save the opera association. He retired as manager in 1950, and was succeeded by Rudolf Bing (1902-).

Johnson was born at Guelph, Ontario, Canada, and studied voice at Florence, Italy. In 1912 he made his debut in Padua, Italy, and for five years was the leading tenor at the La Scala Opera House in Milan. After two years with the Chicago Opera Company, he joined the Metropolitan in 1922. He became an American citizen in the same year. F.B.

JOHNSON, HALL (1888-). See GEORGIA (Arts and Crafts).

JOHNSON, HIRAM WARREN (1866-1945), was United States Senator from California for twenty-eight years. He was born in Sacramento, and was educated at the University of California. Johnson was admitted to the bar at the early age of twenty-one. He attracted attention by his prosecution of graft cases in San Francisco in 1906 and 1907. The Republican party nominated him for governor of the state in 1910, and he was elected. In 1912, he joined Theodore Roosevelt in the revolt against the Republican party, and ran for Vice-President on the Progressive ticket. He entered the United States Senate in 1917. Johnson was one of the three senators who opposed United States membership in the United Nations in 1945. E.E.RO.

Acme

Hiram Johnson, Senator from California, 1917-1945

JOHNSON, HUGH SAMUEL (1882-1942), was successful as a soldier, businessman, administrator, and writer. He was born at Fort Scott, Kan., and was graduated from the United States Military Academy at West Point. He served in Mexico in 1916 and became a brigadier general in 1918. Johnson worked out the selective service system of World War I. In 1919, he left the army to go into business. In 1933 he was called to manage the National Recovery Administration, and later became a newspaper columnist. E.E.RO.

JOHNSON, "JACK," JOHN A. (1878-1946). See BOXING.

JOHNSON, JAMES WELDON (1871-1938), was an American Negro writer of musical plays and light operas. From 1916 to 1930, he was secretary of the National Association for the Advancement of Colored People. During the rest of his life, he was professor of creative literature at Fisk University.

Johnson was born in Jacksonville, Fla., and studied law at Atlanta and Columbia universities. He was United States Consul at Puerto Cabello, Venezuela (1906-1909), and at Corinto, Nicaragua (1909-1912). G.S.B.

His Works include *Autobiography of an Ex-Colored Man; Book of American Negro Poetry; Book of American Negro Spirituals;* and *Negro Americans, What Now?*

JOHNSON, MARTIN ELMER (1884-1937), and **OSA HELEN LEIGHTY** (1894-), traveled around the world six times as motion-picture explorers. They were married in 1910, when Johnson was lecturing about the voyage he had made to the South Seas with Jack London on the *Snark* (1907-1908). The story of the Johnsons' travels to the South Seas (1912), the Hebrides (1914), Borneo (1917-1919), and Africa (1921-1936) is told in Osa Johnson's books, *I Married Adventure* and *Bride in the Solomons.* She also wrote *Jungle Babies* and other animal stories, and helped her husband with his writing.

They had returned from a second expedition to Borneo when Martin Johnson was killed in a plane crash in California. He was born in Rockford, Ill., and his wife in Chanute, Kan. G.S.B.

JOHNSON, PAULINE (1862-1913), was a Canadian poet. She wrote *Flint and Feather*, a book of verse about Indian life. Her father was Chief Onwanonsyshon of the Mohawk Indians. Her mother was English. W.S.W.

JOHNSON, RICHARD H. See GLIDER (Glider Records).

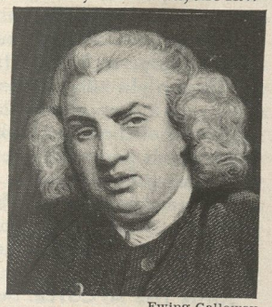
JOHNSON, RICHARD MENTOR (1780-1850), was the only Vice-President of the United States ever elected directly by the Senate. In the election of 1836, no candidate for the vice-presidency received a majority of the votes of the electoral college. Johnson was elected by the Senate and served for one term.

JOHNSON, SAMUEL (1709-1784), is remembered more for his personality than for his writings. His heavy and awkward style kept both his prose and poetry from ever becoming very popular. Oliver Goldsmith, the poet and playwright, said of Johnson's manner of writing that he made "little fishes talk like whales." Johnson's famous *Dictionary* was one of the first attempts to make an organized dictionary of the English language. It was based on an earlier work by Nathaniel Bailey.

But the influence of Johnson as a man was very great. He organized the London Literary Club with the famous painter Joshua Reynolds. There Johnson outtalked the greatest literary men and artists of the time. His judgment was highly respected, and he had great influence

in getting the works of unknown writers published.

Most of our knowledge of Johnson has come from a remarkable biography of him written by his friend, the lawyer James Boswell. Boswell wrote one of the fullest portraits of a man ever given. He loved and admired Johnson, but he was too honest not to give a picture of all Johnson's faults and weaknesses. His *Life* pictures Johnson as a large awkward man, badly dressed and rude in manner. His face was scarred by disease. He was a man who would tell his hostess to stop talking nonsense, who would call a distinguished guest a "vile Whig," who would lean back at the table to "blow out his breath like a whale," and who abused everyone who disagreed with him. But Thomas Carlyle said of him that he was "a mass of genuine manhood, a man who would starve before he bartered away his independence, and who was loved and honored by all who knew him."



Ewing Galloway

Samuel Johnson compiled one of the first dictionaries of the English language.

Johnson was the son of a poor bookseller of Lichfield. He was born with the disease of scrofula, and when he was only three his parents took him to London in a useless attempt to have him healed by the "royal touch" of Queen Anne. His constant reading of his father's books proved a more important education than his regular schooling. Johnson entered Oxford University in 1728, but had money enough to attend only two years. In 1735 he married a woman much older than he was, and with her dowry of 800 pounds (about $4,000), they started a private school in Lichfield.

The school soon failed, and Johnson moved to London to try to write. Years of failure and discouragement followed. He began writing for the *Gentleman's Magazine* in 1738, and published his first poem, *London*, in the same year. *The Vanity of Human Wishes* appeared in 1749, and his tragedy *Irene* was produced soon afterward. He also published the papers the *Rambler* (1750-1752) and the *Idler* (1758), but they were not popular.

His *Dictionary of the English Language* was published in 1755, after eight years of work. Johnson's humor and prejudice appear frequently in this work, as shown in his definition of oats as "a grain given in England to horses, and in Scotland to the people." His only novel, *Rasselas*, was written in 1759 to pay the expenses of his mother's funeral.

In 1762, the Earl of Bute gave Johnson a grant of 300 pounds (about $1,500) a year for life. In 1765, Johnson published his edition of William Shakespeare's plays, and in 1775 wrote a description of a trip he took with Boswell to the Hebrides. Three years before his death he completed his last work, *Lives of the Poets*. G.E.B.

See also BOSWELL, JAMES; ENGLISH LITERATURE (Age of Johnson).

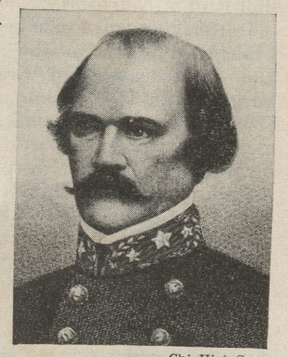
JOHNSON, WALTER PERRY (1887-1946). See BASEBALL (Immortals).

JOHNSON ACT OF 1934. See WORLD WAR II (Arsenal of Democracy).

JOHNSON COUNTY CATTLE WAR. See WYOMING (Progress as a State).

JOHNSON C. SMITH UNIVERSITY is a coeducational liberal arts and theological school at Charlotte, N.C. It is controlled by the Presbyterian Church, and special emphasis is placed on the training of ministers, lay church workers, and teachers. Smith was founded in 1867 and has an average enrollment of about 650. H.LI.

JOHNSTON, ALBERT SIDNEY (1803-1862), was a Confederate general in the War between the States. He was considered one of the best generals of the South. At the Battle of Shiloh he attacked General Ulysses S. Grant's forces while they were resting and waiting for more troops. With General Pierre Beauregard he succeeded in driving Grant's forces back, but Johnston was killed in the battle.



Chi. Hist. Soc.

Albert S. Johnston commanded Confederate forces at the Battle of Shiloh.

Johnston was born in Washington, Ky., and was graduated from the United States Military Academy at West Point in 1826. He became chief of staff to General Atkinson in the Black Hawk War. In 1836 he joined the Texas army in the war for independence from Mexico, and later became commander in chief. After the Mexican War, he joined the United States Army and commanded the expedition against the Mormons in Utah in 1857. H.J.E.

See also WAR BETWEEN THE STATES.

JOHNSTON, ERIC (1895-), is a leading American businessman and a spokesman for liberal capitalism.

Johnston was born in Washington, D.C., but grew up in the West. He studied law at the University of Washington, and served with the intelligence service of the Marine Corps in China from 1917 to 1922. Later he developed a number of electrical and building supply enterprises in Spokane, Wash.

Harris & Ewing

Eric Johnston was elected head of the American motion-picture industry in 1945.

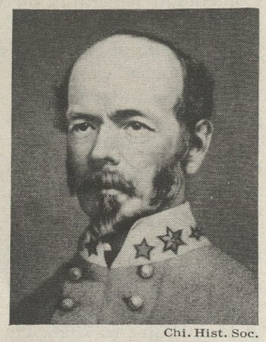
Johnston became active in commercial development organizations and was elected president of the United States Chamber of Commerce in 1942. He held this office until 1946. During World War II, he served on such Government committees as the Economic Stabilization Board, the Economic Policy Committee of the State Department, and the management-labor committees of the War Production Board and the War Manpower Commission.

Johnston traveled widely in the United States, South America, England, and the Soviet Union. From his travels he wrote the book *America Unlimited*, with Eugene

Lyons as co-author. Johnston was made president of the Motion Picture Producers and Distributors of America, in 1945. He became the administrator of the Economic Stabilization Agency in January, 1951.

JOHNSTON, HARRIET LANE (b. 1833). See BUCHANAN, JAMES (Harriet Lane).

JOHNSTON, JOSEPH EGGLESTON (1807-1891), was a Confederate general during the War between the States. He was placed in command of the Confederate Army in the Shenandoah Valley in 1861, and was active in the first Battle of Bull Run at Manassas.



Chi. Hist. Soc.

Joseph Johnston led a Confederate army in one of the last battles of the War between the States.

In 1862 he was wounded while in command of the main Confederate army in Virginia. In November, 1862, Johnston took command of the military department of Tennessee and Mississippi. He tried to relieve Vicksburg, Miss., which was besieged by General Ulysses S. Grant, but could not raise a large enough force. The next year he became commander of the Army of Tennessee.

In the Atlanta campaign, he skillfully opposed General William Tecumseh Sherman, but could not prevent Sherman from reaching Atlanta. The President of the Confederacy thought him too cautious and replaced him with General John Hood. After Hood's defeat at Nashville, Tenn., Johnston was reappointed in 1865 to command what was left of the Confederate army. He fought one of the last battles of the war at Bentonville, N.C., in March, 1865, and surrendered in April.

Johnston was born in Cherry Grove, Va. He attended West Point with Robert E. Lee, and was graduated in 1829. He fought in the Mexican and Seminole wars before resigning from the United States Army in 1861 to serve with the Confederacy. After the war, Johnston became a member of Congress and served as a United States railroad commissioner. H.J.E.

See also WAR BETWEEN THE STATES.

Brown Bros.

Mary Johnston, American novelist, wrote many books about early America.

JOHNSTON, MARY (1870-1936), was an author of novels based on early American history. Her most successful book, *To Have and to Hold*, is a vivid story of colonial Virginia. She was born in Buchanan, Va. L.C.WI.

JOHNSTOWN, Pa. (population 63,232). This city is one of the centers of soft, or bituminous, coal mining in Pennsylvania. It lies in a valley of the Allegheny Mountains about 75 miles east of Pittsburgh.

The chief industry of Johnstown is the production of steel. Other factories in the city produce radiators, furniture, clay products, silk, and textiles. A junior college of the University of Pittsburgh is located in Johnstown.

History. Johnstown was named for a Swiss immigrant named Jahns, or *Johns*, who settled on the site of the city in 1791. In 1889 Johnstown became a city. In the same year a dam of the South Fork Reservoir, twelve miles east of the city, broke during heavy rains. The water which poured down the valley and over Johnstown caused the death of 2,200 people and caused property damage of more than $10,000,000. The city is now protected by a flood-control system. R.O.H.

JOHN THE ALMONER, *AL mun er*. See CHRYSOSTOM, SAINT JOHN.

JOHN THE APOSTLE. See APOSTLE.

JOHN THE BAPTIST (about 7 B.C.-A.D.28) was the great prophet who came before Christ and predicted His coming. His mother, Elizabeth, was the cousin of Mary, the mother of Jesus. John was born six months before the birth of Jesus. Most of his life was spent at his home (perhaps Hebron) in the hill country of Judea. He began to preach along the banks of the River Jordan about A.D. 26. He urged people to repent of their sins and predicted the coming of the Messiah and judge, "one greater than myself." The name *John the Baptist* was given to him because he baptized people, or washed them, in the River Jordan as a sign of cleansing from sin. Jesus came to him to be baptized (Matt. 3:13-17).

The story of John's death is told in Mark 6. He had been put in prison by Herod, the tetrarch (ruler of Galilee), because he had condemned Herod for having married his brother's wife, Herodias. Herodias was determined to revenge herself. She asked Salome, her daughter, to dance for Herod at a feast. Herod was so pleased by her dance that he promised her any reward she wanted. Salome demanded the head of John the Baptist. After John's death, his disciples were found as far away as Ephesus (Acts 19:3-4). F.C.G. and F.J.S.

See also HEROD (Herod Antipas).

JOHN THE EVANGELIST, SAINT, was the son of Zebedee and Salome, and the brother of Saint James the Greater. Saint John, his father, and his brother were fishermen. Saint John the Evangelist was the "beloved disciple of Christ" and also a disciple of Saint John the Baptist. Saint John the Evangelist was the only one of the Apostles who remained faithful to Christ during His suffering. Christ, crucified on the Cross, told him to take care of His mother, Mary.

After Christ ascended into heaven, John and Peter helped to establish the Church. Later John traveled from Jerusalem to Asia Minor, still engaged in missionary work. At Patmos he wrote the Book of Revelation, sometimes called the Apocalypse. Later he returned to Ephesus and wrote his Gospel and Epistles. John was the only disciple of the twelve to die a natural death. His feast day in the Roman Catholic Church is December 27. See also APOCALYPSE; APOSTLE. S.M.S.

JOHORE, *joh HOHR*, one of the states of the Federation of Malaya, lies at the southern tip of the Malay Peninsula. It is connected with the island of Singapore on the south by a sea wall, or causeway. Singapore depends on the hills of Johore for water. Johore is a

British protectorate, ruled by its own sultan with the help of British advisers.

Johore covers an area of 7,330 square miles. The country has fewer mountains than the other Malay States, but Mount Ophir, in the northwest, rises 4,186 feet above sea level. Most of Johore is covered with thick tropical jungle. Along the railroad and highways there are rubber and pineapple plantations.

The population of Johore is an estimated 738,000. The native Malays live along the west coast. They build their houses on stilts above the mud flats. The Chinese and East Indians, who were brought in to supply labor for the plantations, outnumber the natives. Most of the plantations are owned by foreign interests. The chief exports are rubber, pineapple, gutta-percha, timber, and copra.

Great Britain gained control of Johore in treaties made with the sultan in 1885 and 1914. Johore was occupied by Japanese forces during World War II. R.PEA.

See also MALAY PENINSULA; SINGAPORE; UNFEDERATED MALAY STATES.

JOINER. See CARPENTRY.

JOINERS OF AMERICA. See CARPENTERS AND JOINERS OF AMERICA, UNITED BROTHERHOOD OF.

JOINT. See GEOLOGY (Terms).

JOINT is the place at which two bones meet in the skeleton of the body. This place is also called an *articulation*. Joints may be *immovable* or *movable*. Immovable joints are found where the bones are almost directly in contact with each other, and are separated only by a thin layer of connective tissue. These joints usually do not move, but in case of accident may move enough to keep a bone from breaking. The joints of the cranium, or skull, are immovable and help protect the brain.

Movable joints are classified as *hinge* joints, *pivot* joints, and *ball-and-socket* joints. Hinge joints are those which permit a forward and backward motion in one plane, like the motion of a door on its hinges. The joints at the elbow, knee, and fingers are hinge joints. Pivot joints give a rotating motion, such as the movement of the head from side to side. Ball-and-socket joints allow the greatest freedom of movement. These joints are made up of a large round end of a long bone which fits into the hollow of another bone like a ball in a socket. The hip and shoulder are made up of ball-and-socket joints. The arms, however, have a greater range of motion than the legs because of the arrangement of the ligaments and also because the shoulder blade is not so firmly anchored to the vertebral column.

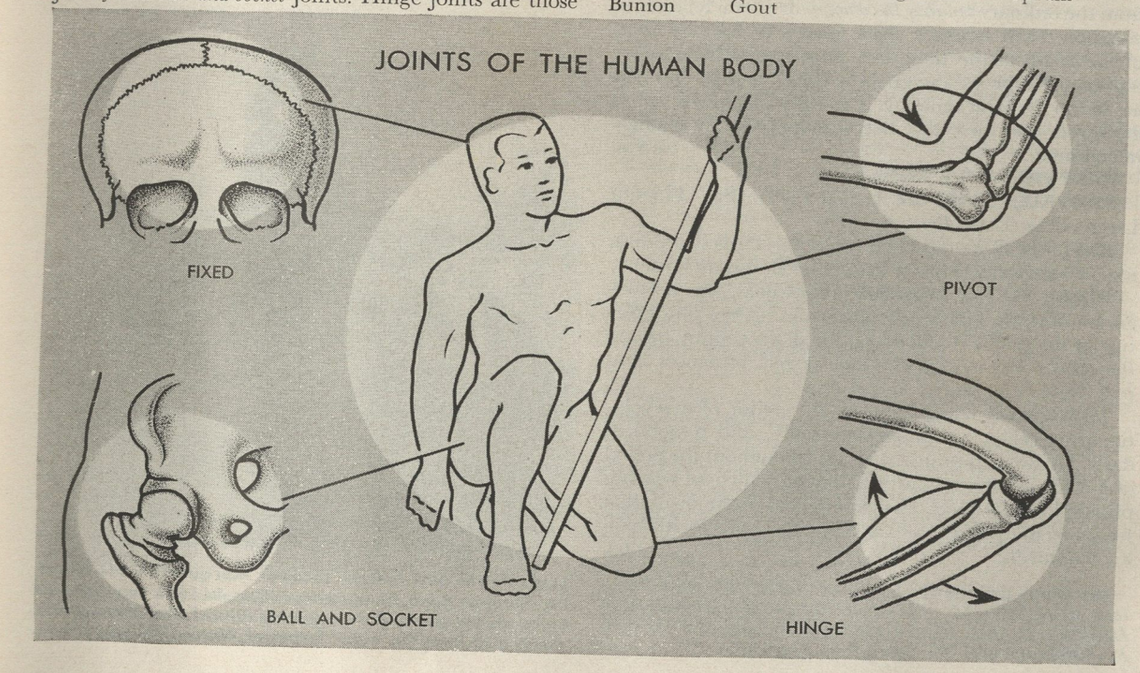
The movable joints are protected in several ways. A layer of cartilage, or gristle, protects the ends of bones which move over one another. The elasticity of the cartilage breaks the force of sudden jars. The smooth texture of the cartilage also makes it possible for the joint to move easily.

Movable joints are also protected by a liquid substance called *synovial fluid*, which keeps the joints moist, or lubricated. Bones are held in place at the joints by strong ligaments which are fastened to the bones above and below. At the hip a number of ligaments circle the bone like a collar to keep the joint in place.

Joints are often sprained or dislocated. A sprain occurs when the ligaments around a joint are torn or badly stretched. Serious sprains are painful, and if neglected may result in stiffening of the joint. Dislocated joints should be treated as soon as possible by a physician. Inflammation of the joints may result from infections or from disturbances such as arthritis. A.B.H.

Related Subjects. The reader is also referred to:

Ankle	Cartilage	Hip	Rheumatism
Arthritis	Dislocation	Ligament	Sprain
Bunion	Gout		



JOINTED GLASSWORT. See GLASSWORT.

JOINT-STOCK COMPANY is a form of business organization in which the money to carry on this business is obtained by selling shares of stock to a number of individuals. It is the parent of the modern corporation, in which stock is sold to the general public.

The joint-stock idea was introduced into business in the early 1500's, after explorers had found all-water routes to the Far East and had discovered America. Traders who wished to use these new routes required more money for their ships and cargo than had ever before been needed in business. The trade was risky, too. The sale of shares made it possible to get money from many people, and also divided the risk.

The East India Company, the most famous of the English joint-stock companies, was chartered in 1600. It traded with and ruled India until 1858. The Hudson's Bay Company was chartered in 1670 to trade in northern Canada. It is still in business there. R.D.P.

See also CORPORATION; EAST INDIA COMPANY; HUDSON'S BAY COMPANY; PARTNERSHIP.

JOINT TENANCY. Two or more persons sometimes share the title to a piece of real property, with equal rights to the use and enjoyment of the property during their lives. At the death of each owner, the entire estate goes to the survivors and so on to the last survivor. The last survivor becomes full owner of the property, with an estate in fee simple. This kind of ownership is called *joint tenancy*.

Joint tenancies were once limited to real estate, but today a joint tenancy may be created in personal property as well. For example, two or more persons might make this kind of arrangement in regard to the content of a safety deposit box.

The right of survivorship distinguishes a joint tenancy from the ordinary *tenancy in common*. Under a tenancy in common, each tenant's share passes to his own heirs at the death of the tenant. A joint tenant can convey his share in the estate to some other person, but this act severs the joint tenancy. The right of survivorship is destroyed, and the estate becomes an ordinary tenancy in common. R.F.B.

JOINT WORM. See WHEAT.

JOINVILLE, JEAN DE (1224?-1317). See FRENCH LITERATURE (Early Period).

JOIST. See BUILDING CONSTRUCTION (Parts of a Building); CARPENTRY (How a Carpenter Builds a House).

JÓKAI, *YO koy*, **MAURUS** (1825-1904), was a Hungarian novelist. His nearly 300 books present a full picture of the political and social life of his country during the 1800's. His writings include novels, romances, dramas, humorous essays, and poems.

Jókai gained recognition as the editor of a revolutionary weekly, a humorous weekly, and a political daily. He was a prominent figure throughout the period of the Hungarian revolution, during which he was imprisoned but escaped. His experiences in the revolution furnished many of the settings and the plots for his best-known novels. L.J.

His Works include *A Hungarian Nabob; The New Landlord; Black Diamonds; The Modern Midas; The Comedians of Life; God Is One; History of Hungary;* and the dramas *King Koloman* and *The Martyrs of Szigetvar*.

JOKE. The word *joke* has many meanings. Most jokes are little stories told for the purpose of making a person laugh. But some are tricks that are played on persons. These can be harmless, such as the usual jokes played on April Fool's Day, like putting salt in the sugar bowl. Other jokes are called *practical jokes*, and may be quite harmful. Their purpose is to hurt, not to amuse, and persons have been known to be killed through being the victims of this kind of joke. Sometimes the expression "He did it as a joke" is used, meaning that "He did not mean what he did." Often a person or thing is referred to as a joke, as in the sentence, "The election was just a joke," meaning that it was ridiculous.

JOLIET, Ill. (population 51,601), is an industrial city forty miles southwest of Chicago. It lies on the Des Plaines River and the Chicago Sanitary and Ship Canal. Joliet's industries produce wire, petroleum products, chemicals, machinery, and wallpaper. Stateville penitentiary is located near Joliet. Originally called Juliet, the city was renamed for Louis Joliet, the French explorer, in 1845. Joliet is the seat of government for Will County. P.M.A.

JOLIET, *ZHOH LYEH*, **LOUIS** (1645-1700), was a Canadian explorer. With Father Jacques Marquette and five companions Joliet discovered that the Mississippi flowed into the Gulf of Mexico. Until then, it had been generally believed that the Mississippi flowed into the Pacific.

Joliet was born in Quebec, and was educated to be a priest at the Jesuit College in Quebec. He was fond of adventure and made several trips on the Great Lakes.

Joliet, Father Marquette, and their party set out to trace the Mississippi in 1673. They were sent by Louis Frontenac, the governor of Canada. They started from St. Ignace on May 17. Traveling in birchbark canoes, the explorers crossed Lake Michigan to Green Bay and

Brown Bros.

Louis Joliet and Father Jacques Marquette made one of the first trips down the Mississippi River. In 1673 they traveled as far as the mouth of the Arkansas River. Father Marquette is standing to bless the wide "Father of Waters."

then paddled down the Fox River. They went overland to the Wisconsin River, and down the Wisconsin to the Mississippi. They followed the Mississippi's winding course southward beyond the mouth of the Arkansas River. Joliet and his companions did not go all the way to the Gulf of Mexico because they were afraid of the Spaniards. Then they returned to Quebec by way of the Illinois River and Lake Michigan. Joliet lost all the maps he had made during the trip on the rough rapids of the Saint Lawrence. But he drew a map of his discoveries from memory.

As a reward for his work, the French governor gave Joliet the Island of Anticosti in the Gulf of Saint Lawrence. In 1697, he was given Joliet, a town south of Quebec, which his descendants still possess. J.COT.

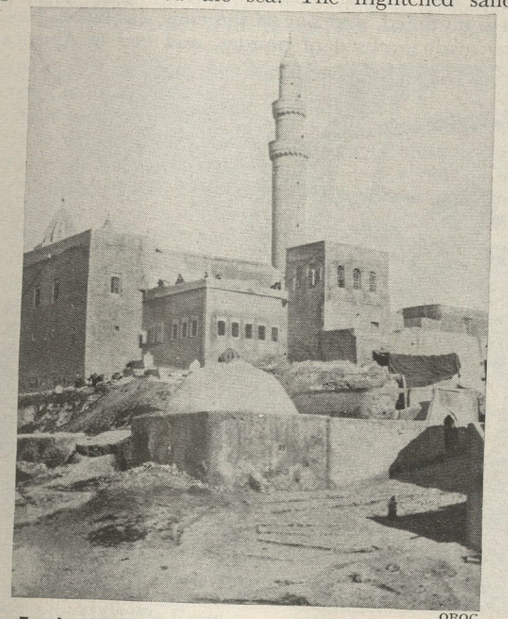
See also CHICAGO (Early Days); MARQUETTE, JACQUES.

JOLIOT, FRÉDÉRIC (1900-). See CURIE (Irène Joliot-Curie).

JOLSON, AL (1886-1950), was a well-known American actor and singer. His name originally was Asa Yoelson, and he was born in Russia. He came to the United States with his family when he was about seven years old, and lived in Washington, D.C. Jolson starred in *The Jazz Singer* and *Singing Fool*, two of the earliest motion pictures in sound. He was well known for his "black face" roles. He died soon after his return from Korea, where he had entertained American troops.

JONAH was a Hebrew prophet of the 700's B.C. (II Kings 14-25). He is the hero of the Old Testament book of Jonah. The book was written by some unknown author after the Hebrew exile.

The story says that God commanded Jonah to go to Nineveh and warn it of destruction. Instead he went to Joppa and boarded a ship bound for Tarshish. A great storm lashed the sea. The frightened sailors



OROC

The Tomb of Jonah is said to have been located on one of the mounds of Nineveh. A Moslem mosque now stands on the spot, which is near Mosul in modern Iraq.

thought the tempest was due to some evil person on board. They threw lots to discover him. The lot fell on Jonah, and he was cast into the raging sea. Immediately the storm ceased. As Jonah sank into the waves, he was swallowed by a great fish sent by God to save him.

At the end of three days and nights, the prophet was cast forth upon dry land. God again ordered him to go to Nineveh. Jonah obeyed. He preached so earnestly to the people that they repented. The Lord forgave them, and the city was not destroyed.

Jonah was greatly annoyed, for he thought the people would look on him as a false prophet. He left the city in a rage. But God rebuked him. He taught Jonah to have pity for the thousands of the great city, which was the historic enemy of Israel. It is obvious that the writer's purpose is to rebuke the national selfishness of his people. He wishes to teach them that they have a God-given mission to all other nations. W.A.I.

JONATHAN. See DAVID; SAUL.

JONATHAN, BROTHER. See BROTHER JONATHAN.

JONES, "BOBBY," ROBERT TYRE (1902-). See GOLF (History).

JONES, EDWARD COLEY BURNE. See BURNE-JONES, EDWARD COLEY, SIR.

JONES, ELI STANLEY (1884-), is one of the best known of American missionaries. During his many years in India, he made many converts to Christianity among all classes of Indians. His books have greatly increased understanding of India by peoples of other countries.

Jones was born in Clarksville, Md. He was not interested in religion until he was almost grown. One day by chance he went to a church service to hear an English clergyman. His interest in Christianity grew from that time on. He attended Asbury College (Kentucky), and decided to become a Methodist missionary in India.

His work in India began in 1907 at Lucknow, where he preached and taught among the low-caste Indians. After several years he decided to work among the high-caste Indians, and found much success in converting them. He increased his knowledge of Indian culture by studying with the poet Rabindranath Tagore and by talking to such Indian leaders as Mahatma Gandhi. His first book, *The Christ of the Indian Road*, was published in 1925. It was translated into twelve languages and sold more than 600,000 copies.

Jones was elected a bishop of the Methodist Church in 1928, but declined the office because he wished to continue as a missionary in India. W.W.S.

His Works include *Christ at the Round Table; The Christ of Every Road;* and *Christ and Human Suffering*.

JONES, ELIZABETH ORTON (1910-), is an American artist and writer, well known for her children's books. She won the Caldecott Award for 1944 for her illustrations of *Prayer for a Child*.

Elizabeth Orton Jones was born in Highland Park, Ill., and was graduated from the University of Chicago. She also studied at the Art Institute of Chicago, was graduated from the École des Beaux Arts at Fontainebleau, France, and studied under Liausu in Paris. H.BO.

See also CALDECOTT MEDAL.

Her Works include *Ragman of Paris; David; Maminka's Children;* and *Twig*.

JONES, ERNEST CHARLES (1819-1869). See CHARTISM.

JONES, HENRY ARTHUR (1851-1929), was an English writer of plays and essays. His social dramas were popular both in England and the United States, and were noted for their bright, clever dialogue.

Jones was born in Buckinghamshire, the son of a farmer. He had to leave school when he was thirteen years old, and obtained the rest of his education through his own efforts. In 1879, his first play, *The Clerical Error*, attracted attention in London. Two years later his *The Silver King* ran for a year. B.M.

His Works include *Saints and Sinners; The Liars; Mrs. Dane's Defense; The Dancing Girl; Whitewashing Julia; The Hypocrites;* and *Mary Goes First*. His *The Renascence of the English Drama* was a collection of essays and lectures.

JONES, INIGO (1573-1652), revolutionized English architecture. He introduced into England the style of simple and balanced construction that Sir Christopher Wren later brought to its greatest development.

Jones was born in London, and worked first as a designer of scenery for plays by Ben Jonson. He went to Italy and studied under the architect Andrea Palladio (1518-1580). Jones took back to England many of the ideas of Italian Renaissance architecture.

He became court architect to James I in about 1618, and designed the Whitehall palace group. Only the banquet hall had been completed by the time of the Cromwell rebellion. Jones died before the Restoration, but the buildings were completed according to his design.

His Queen's House in Greenwich, and some houses in Lincoln's Inn and in the English countryside still remain. His small churches influenced American church design. M.C.C.

JONES, JESSE HOLMAN (1874-), was a leading figure during President Franklin D. Roosevelt's administration. In his various official positions Jesse Jones directed the use of many billions of dollars. He went to Washington in 1932 as a director of the Reconstruction Finance Corporation. The next year he became its chairman. In this position he gained a reputation for wisdom in using Federal funds in building up American industry after the financial depression of the 1930's.

In 1936, Jones became chairman of the executive committee of the Export-Import Bank, and in 1939, he was named administrator of the Federal Loan Agency. Roosevelt added him to his cabinet as Secretary of Commerce in 1940. Jones gave up all his positions in 1945.

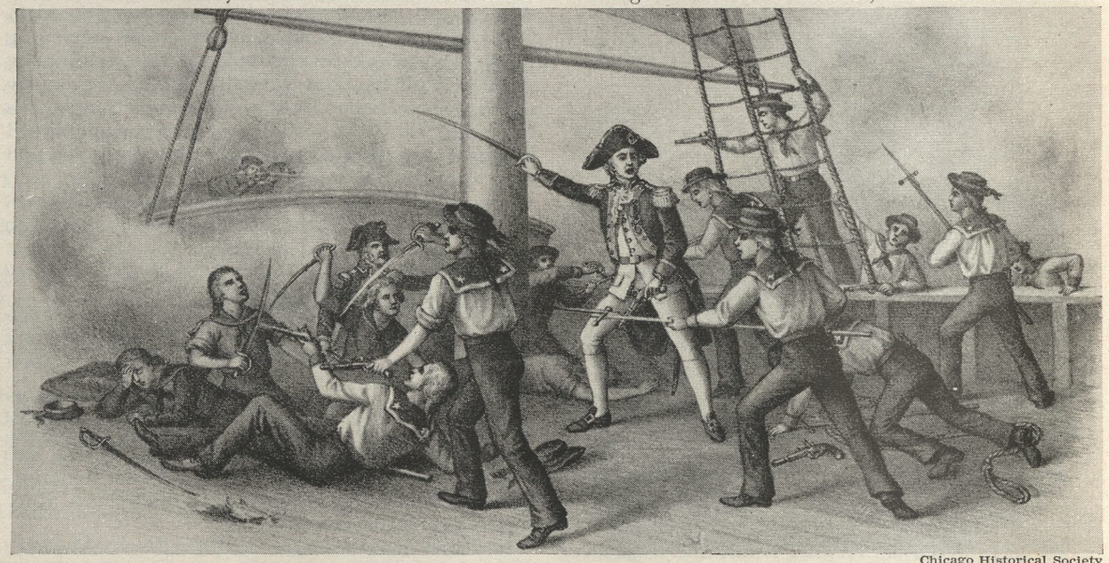
Jones was born in Robertson County, Tennessee, and went to Dallas, Tex., to become a lumberman. In 1909, he moved to Houston, Tex., where he became a banker, building contractor, and newspaper publisher. G.S.B.

JONES, JOHN PAUL (1747-1792), is often called the "Father of the American Navy." His heroism in fighting against a larger and better-equipped enemy fleet established a tradition which has never been forgotten. His reply to a British demand to surrender, "I have not yet begun to fight," has become a navy slogan.

Culver

John Paul Jones, American naval hero who won fame during the War for Independence

Jones was born in Kirkcudbrightshire, Scotland. His name was originally John Paul. He went to sea when he was twelve years old, and in 1769 was given command of the merchant ship *John*. On a trip to the West Indies, a sailor died of a flogging Jones gave him, and Jones was charged with murder. But he was later freed, and became captain of the *Betsey* in 1773. His crew mutinied, and one of the crew was killed. Jones was again accused of murder, and fled to America.



Chicago Historical Society

John Paul Jones Leads His Men in the fierce fight against the English warship "Serapis." The battle took place on the Irish Sea during the American Revolution. The enemy ship was bigger and had more guns, so Jones sailed alongside and tied his vessel, the "Bonhomme Richard," to it. After several hours of fighting, the English captain surrendered.

There he added Jones to his name, probably to hide his true name.

Commissioned in Navy. The outbreak of the Revolutionary War gave Jones a chance to go back to sea. He received a commission as a lieutenant in the Continental Navy on December 7, 1775, and became first lieutenant of the *Alfred*, the first naval ship bought by the Continental Congress. In 1776, Jones was given command of the *Providence*. Later he received command of a small squadron and was promoted to the rank of captain. Jones took as his flagship the frigate *Ranger*. He was probably the first to fly the new American flag while he was aboard this ship. The *Ranger* was also the first American man-of-war to receive a foreign salute. This occurred in 1778, when the *Ranger* was in Quiberon Bay, France.

Jones made a cruise in the *Ranger* in 1778. He raided Whitehaven on the Irish Sea coast of England, but was unsuccessful in burning the shipping in the harbor. Shortly afterward, he captured the British sloop *Drake* off Carrickfergus, Ireland, and returned to Brest, France, after taking seven merchant ships as prizes.

Defeat of the Serapis. In 1779, Jones took command of the *Bonhomme Richard*, which he named in honor of Benjamin Franklin. In this ship he once more led a small squadron into the Irish Sea. On September 23, his squadron met a large British convoy. The *Bonhomme Richard* attacked the leading ship of the force, the *Serapis*. The *Serapis* was larger and better armed than Jones' ship, so Jones took his vessel alongside the *Serapis*. The ships were so close that their rigging became entangled and the muzzles of their guns touched each other.

The British commander called on Jones to surrender, and it was then that Jones said, "I have not yet begun to fight." After three hours of terrible hand-to-hand fighting, the tall mast of the *Serapis* fell, and the British surrendered. The *Bonhomme Richard* was so badly damaged that it sank the next day. Jones continued on to France in another ship.

Russian Service. After the end of the war, Jones was given command of the *America*. A move to promote him to rear admiral was defeated, but he was given a gold medal. The *America* was soon given to France, and the American navy was abolished. Jones studied naval tactics aboard French naval vessels for a time, and wrote on naval tactics. In 1787, Empress Catherine of Russia persuaded Jones to serve as rear admiral in the Black Sea fleet which was then fighting the Turks. Jealousy on the part of other Russian officers made Jones' position difficult, and he soon left Russia for Paris. There he lived the rest of his life.

Jones was appointed United States commissioner to Algiers in 1792, but died before the appointment reached him in Paris. In 1905, his body was brought back to the United States, where it was buried in a tomb at the United States Naval Academy, Annapolis, Md. In the same year, Jones was nominated for the Hall of Fame. But the nomination was rejected because of his Russian service, and he was not elected to the Hall of Fame until 1925. C.L.L.

See also HALL OF FAME.

JONES, PERCY, GENERAL HOSPITAL. See BATTLE CREEK.

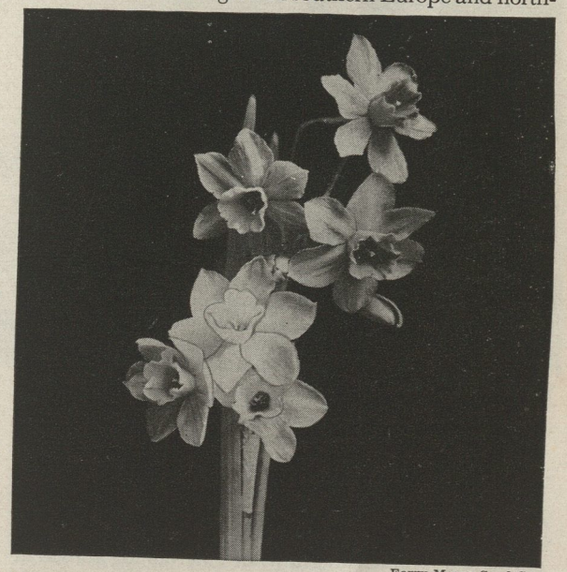
JONES ACT. See PHILIPPINE ISLANDS (History [Steps toward Self-Government]).

JONES LAW. See PROHIBITION.

JONGLEUR, *ZHAWN GLER*. See MINSTREL.

JONKER. See DIAMOND (Famous Diamonds).

JONQUIL, *JAHNG kwil*, is the name of several yellow narcissus which first grew in southern Europe and northern Africa. They have a sweet odor and have been planted in several other countries. The best known are the *common jonquil* and the *sweet-scented jonquil*. They are very much alike. Jonquils bear from three to six dainty flowers on a stalk about a foot high. The flowers have yellow petals grouped around a yellow tube about an inch long. The flower stem has no leaves, but leaves spring from the bulb. The leaves are glossy dark green, and very narrow. They look like rush leaves. The name *jonquil* comes from a Latin word *juncus*, which means *rush*.



Ferry-Morse Seed Co.

The Fragrant and Dainty Yellow Jonquil is one of the first spring flowers. Its slender long leaves are similar to those of the rushes that grow along the banks of streams.

Jonquils are grown from bulbs that are planted in autumn, four inches deep in well-drained, rather rich soil. When they are planted outdoors they bloom in April, but they can be raised in greenhouses so that they bloom in January. A.C.Ho.

See also DAFFODIL; NARCISSUS.

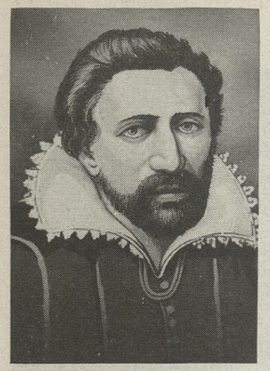
Classification. Jonquils belong to the *Amaryllidaceae* family. The common jonquil is classed as *Narcissus jonquilla*. The sweet-scented jonquil is *N. odorus*.

JONSON, BEN (1573?-1637), was a famous English dramatist and lyric poet. He was particularly well known for his lyrics, many of which have been set to music. One of the most familiar is "Drink to Me Only with Thine Eyes."

Jonson followed the Greek and Roman classic standards more closely than any playwright of his time. He fought unsuccessfully against the romantic tendency in literature. His plays are historically accurate and logi-

cally constructed, and his characters are presented with considerable realism.

Jonson was born at Westminster and attended Westminster Grammar School. It is believed that he later went to Cambridge University. He started learning the bricklayer's trade, but ran away to join the army to fight the Spaniards in The Netherlands. Later he returned to England, where he became an actor and reviser of old plays.



Ben Jonson, English dramatist and poet, was a friend of William Shakespeare.

Jonson's first important play, *Every Man in His Humour*, was presented in 1598. It made fun of the London city life. William Shakespeare, a friend and coworker of Jonson, played one of the parts. Many other dramatic works followed. Jonson's masques (plays which use mythological figures as characters) pleased King James I so much that he made Jonson his poet laureate in 1619.

Jonson's personal life was a stormy one. He quarreled violently with almost all his literary friends, and he barely escaped hanging once for killing an actor in a duel. There is a story that Shakespeare died from the effects of a fever he caught while entertaining Jonson at an inn in Stratford. Jonson himself outlived Shakespeare by twenty-one years. He died in poverty, but was buried with great honor in Westminster Abbey. "O rare Ben Jonson" is the inscription on his tomb. B.H.C.

His Works include the satires *Cynthia's Revels* and *The Poetaster;* the comedies *Volpone, or the Fox* and *The Alchemist;* and the tragedies *Sejanus* and *Catiline*.

JOPLIN, Mo. (population 38,711), is a city of southwestern Missouri, located on the edge of the Ozark Mountains. Joplin was started as a zinc- and lead-mining center. But the mines were gradually worn out, and Joplin has become chiefly a trading center for near-by areas of Kansas, Arkansas, Oklahoma, and Missouri. Over 100 different products are manufactured in Joplin, and there is a growing agricultural market. The city was founded in 1840, and named after the Reverend Harris Joplin, one of its first settlers. R.Sc.

JOPPA. See PALESTINE (Cities [Jaffa]).

JORDAN. The Arab country of Jordan lies east of Israel. It once was called Transjordan because it was located across the River Jordan from Palestine. But it now includes some territory east of the Jordan, in what once was Palestine. In early times, Transjordan and Palestine formed a single country, a land of Jewish prophets and of wandering desert tribes. After World War I, Transjordan was made a separate country under the protection of Great Britain. It became an independent monarchy in 1946 and was officially named *The Hashemite Kingdom of the Jordan.*

The Land and Its Resources. Jordan covers an area of 37,978 square miles. The country has the shape of the spread wings of a butterfly. The southern wing cuts into the heart of the Arabian desert. The northern wing stretches along the Syrian border and the edge of Iraq. Israel forms part of the western boundary. Just east of the River Jordan, the land of Jordan rises to a hilly plateau and a rugged chain of mountains.

Only a narrow stretch of land along the River Jordan, plus small areas in old Palestine, can be farmed. During the days of the Roman Empire, parts of Jordan were rich farmlands. But several hundred years of neglect, coupled with decreased rainfall, caused the fertile fields to fall into sandy decay. Today some efforts are being made to enrich the deadened soil. Farmers are beginning to irrigate the land with the waters of the Jordan. Terraces have been built on the uplands to keep the soil from washing away.

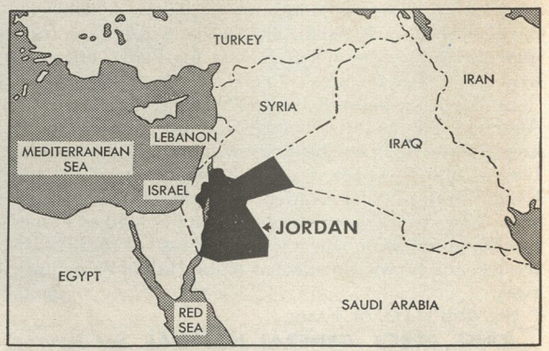
Light rainfall occurs during the winter season. Snow often covers the highland regions. The summers are dry and the days are hot, but some of the nights are cool.

The People and Their Work. Jordan has a population of about 1,686,400. Most of the people are Arabs, and of the Islamic faith. Many of them are wandering tribesmen who tend small herds of sheep or cattle in the hills. The Arab farmers live in small towns and villages. Their way of life is primitive. The chief city of Jordan is Amman (population about 70,000). Jordan also holds part of the city of Jerusalem.

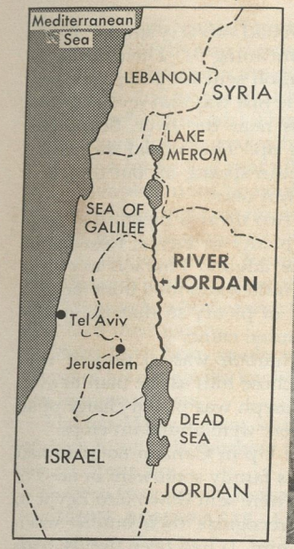
Farming and cattle raising are the chief occupations in Jordan. Farms and orchards in the fertile Jordan valley produce wheat, barley, and various kinds of fruit. Grapes grow well in the hilly uplands. Some of the people work at taking salt, phosphate, and potash from the waters of the Dead Sea.

History and Government. Foreign countries ruled Jordan for many hundreds of years. In very early times, Greeks and Romans brought their civilizations to the country. After 1188, Egyptian kings ruled Jordan for almost 400 years. From the 1500's until the end of World War I, the country was part of the great Turkish Ottoman Empire.

Jordan (then Transjordan) became a mandate of Great Britain after World War I. During the revolt which had immediately followed the war, King Hussein ibn-Ali of the Hejaz had secured Great Britain's promise that the success of the rebellion would bring Arabian independence. As a result of this agreement, Emir Abdullah ibn Hussein was approved by the British as ruler of Transjordan.



Location Map of Jordan



Keystone

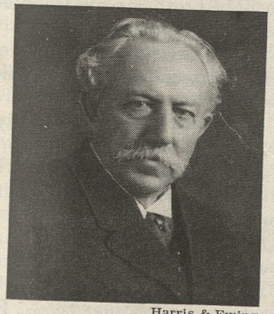
The Historic River Jordan rises on Mount Hermon, plunges below sea level, and flows southward into the Dead Sea. *At right* an Arab pauses to water his horse in the Jordan near its source. It was in the valley of the Jordan that the Christian religion began. The Sea of Galilee, through which the Jordan flows, was the scene of many Biblical events.

In 1946 Transjordan became the independent kingdom of Jordan. Jordan after World War II was the chief enemy of the Jewish state of Israel in the bitter warfare and disputes between the Jews and the Arabs over Palestine. Abdullah's Arab Legion took parts of Palestine. Influenced by the United Nations, an armistice was signed by Israel and Jordan in 1949. In 1950 the Jordan Parliament united Arab Palestine with Jordan.

On July 20, 1951, King Abdullah was assassinated and his son, Talal, succeeded him. King Talal, however, was declared unfit to rule because of a mental condition and his son, Crown Prince Hussein was proclaimed his successor in 1952. In February of that year, Jordan signed the Arab collective security pact. G.B.Cr.

See also ABDULLAH IBN HUSSEIN; AMMAN; ARABIA (map); FLAG (color plate, Asia); PALESTINE; PISGAH, MOUNT.

JORDAN, DAVID STARR (1851-1931), was an American naturalist, educator, and worker for world peace. He was born at Gainesville, N.Y., and educated at Cornell University. After teaching in Illinois, Wisconsin, and Indiana, he became president of Indiana University in 1885. In 1891 he went to Stanford University as its first president, and built that school into an important institution. From 1913 to 1916 he was chancellor of the university. Upon his retirement from this position in 1916 he devoted full time to his peace efforts and his studies of nature. He delivered addresses on peace in most of the states of the Union and in many foreign countries. He also advised the Government on fisheries and fish conservation. E.W.Kn.



Harris & Ewing

David Starr Jordan, noted American educator and promoter of world peace

JORDAN, RIVER, is the most important stream of Palestine. It rises in the springs on the lower slopes of Mount Hermon. Then it falls sharply to Lake Merom, and for a hundred miles its course is below sea level. It winds in and out through a deep valley called the Ghor by the Arabs. At last the River Jordan empties into the Dead Sea, the surface of which lies 1,290 feet below that of the Mediterranean.

In the short distance of ten miles from Lake Merom to the Sea of Galilee the river falls 689 feet. Many rapids and whirlpools make navigation impossible. Along much of the rest of its zigzag journey the water is not more than two or three feet deep except during the flood season in March. Then the melting snow from Mount Hermon often floods the little river valley, which is from one half mile to two miles wide and lies in the center of the larger valley.

The Jordan was the river over which the Bible says Joshua led the Children of Israel into the Promised Land (Josh. 3:1-17). Christ was baptized in its waters by John the Baptist. See also DEAD SEA. W.A.I.

JOSEPH was the husband of Mary, who was the mother of Jesus. He was a carpenter of Nazareth. A law, or decree, of the Emperor Augustus required all the descendants of David to go to Bethlehem to have their names listed. For this reason, Joseph and Mary were in Bethlehem at the time Jesus was born. Jesus was still a baby when Joseph was warned in a dream that Herod, the king of Judea, wanted to kill the child. He fled to Egypt with his family. Soon afterward Herod died, and Joseph brought his family back to Nazareth. Once a year he went to Jerusalem with Mary to attend the Feast of the Passover. They took Jesus with them on one of these journeys, when He was twelve years old.

Little is known of Joseph from this time on. It is be-

lieved that he had died by the time that Jesus began to preach. At the Crucifixion Jesus asked John to take care of His mother. This seems to show that Joseph was already dead. Joseph is venerated as a saint in the Catholic Church. His feast day is March 19. F.C.G.

See also HEROD; PASSOVER; VIRGIN MARY.

JOSEPH was the Hebrew boy who was sold into Egypt by his brothers and became the great prime minister of Pharaoh. The story of Joseph is one of the most interesting dramas of all time. It is powerfully told in the book of Genesis in the Bible.

Joseph was the eleventh of the twelve sons of Jacob, who was ninety years of age when the boy Joseph was born. To the aged father, this son was his dearest child.

As the years passed, Joseph made a practice of going with his older brothers into the fields to help them tend the flocks. One day, when he was seventeen years old, he appeared among them in a coat with long sleeves. It was the gift of his father. Such a cloak could not be worn by peasants or herdsmen. Its long sleeves would get in the way. So it marked out Joseph as intended for some better occupation. The older brothers were jealous that the young boy should be honored above them.

Their jealousy soon turned to hatred when Joseph told them about two wonderful dreams he had. They were visions of his future power as a great ruler, although he did not know what they really meant. He said he dreamed that he was binding wheat in a field with his brothers. Suddenly his sheaf stood upright, while the sheaves of his brothers gathered round and bowed down to it. In the second dream, it seemed to him that the sun, moon, and eleven stars bowed down to him.

One day the brothers were watching their flocks near Dothan. They saw Joseph in the distance coming toward them. One of them said, "Behold, this dreamer cometh. Let us slay him." But Reuben told them to put him in a deep pit without harming him. They agreed to this suggestion after taking his beautiful coat from him.

Later, as they were eating, a band of Ishmaelites suddenly appeared with their camels laden with spices and precious things which they were carrying from Gilead into Egypt. Judah and the other brothers drew Joseph out of the pit while Reuben was not there. They sold him to the Ishmaelites for twenty pieces of silver. The brothers then killed a kid, tore the coat, stained it with the kid's blood, and took it to Jacob. They told him that a wild beast had destroyed Joseph.

A Slave in Egypt. The band of Ishmaelites carried Joseph to Egypt. There Potiphar, the captain of Pharaoh's guard, bought him. Joseph served his master so faithfully that he was made overseer of the household. But he offended Potiphar's wicked wife because he would not return her love for him. She accused him falsely and had him put into prison. But Joseph soon obtained the confidence of the jailer and was placed in charge of all the prisoners.

Pharaoh's chief butler and baker offended their lord, so they were also cast into prison. One night they both had strange dreams. Joseph interpreted these correctly for them. He told the butler that in three days he would be free, but that the baker was to be hanged at the same time. Before the butler left the prison Joseph asked him to try to obtain his pardon. But the butler forgot him.

Two years later, Pharaoh had two very strange dreams which no one knew the meaning of. Then the butler remembered Joseph. Pharaoh sent for Joseph to come to interpret his dreams. The first was that seven fat cows were grazing in the reeds near the river. Seven lean cows came and ate them up. The second dream was that seven good ears of grain sprang up but they were soon devoured by seven thin ones.

Joseph said that those two dreams meant that there would be seven years of plenty in Egypt, followed by seven years of famine. He advised Pharaoh to choose some wise man to gather in the extra food from the land of Egypt during the time of plenty so that the people could be fed when the famine came.

The Prime Minister. Pharaoh was so pleased with Joseph's wisdom that he chose him as the man to oversee the storing of grain. Joseph was put in charge of all Egypt. For seven years there were abundant crops.

Then came the famine. Up in Canaan no grain had been saved. Jacob and his family soon were in need of food. The ten oldest sons were sent down into Egypt to buy food. They did not recognize their brother when they were brought before him. It had been twenty years since they had sold him into slavery. But Joseph knew them at once, for some of the older ones had changed very little. He pretended to think that they were spies and asked them about their home. They said they had still another brother, Benjamin. Joseph told them to go get him in order to prove that what they said was true. As they left he ordered their bags to be filled with grain. The money which they paid him was hidden in the bags. Joseph kept one brother, Simeon, as a hostage.

The old father, Jacob, at first refused to let Benjamin go back with the brothers. But after all the food had been eaten he was obliged to consent. When Joseph saw Benjamin he longed to take him in his arms and weep for joy. Benjamin was his own brother, the son of Rachel, Joseph's mother, while the others were all half-brothers. But Joseph did not tell any of them who he was until he had tested their character. He found that they were thoughtful of their father and their little brother. Then he told about himself.

The brothers were ashamed to look at him. But Joseph told them that he forgave them for their wickedness. After this happy reunion, he told them to go bring their father, with all their families, into Egypt, where they would have plenty of food.

Settling His Family in Egypt. At first Jacob could not believe that his son Joseph still lived and was a great ruler in Egypt. But when he saw the wagons sent to carry all his family into the new land he said, "It is enough. Joseph my son is yet alive; I will go and see him before I die." So all his children and grandchildren, and even great-grandchildren, loaded their things into the wagons and journeyed into the land of Goshen, where Joseph met them. Pharaoh permitted them to settle there. Their descendants lived there until Moses led them out of Egypt.

The Old Testament tale of Joseph is superbly told. The plot is skillfully handled and the characters vividly drawn. It has a rich insight and gives us vivid glimpses of life: old Jacob complaining that life has become too heavy for him, the peasant brothers thinking that Joseph wanted to steal their poor donkeys, the pathetic little gift sent down to the lord of all Egypt — all these word pictures are done quite well. Joseph feels a deep affection for the health and life of "that old man, your father" — and his! There is a deep emotion in the scene where Joseph makes himself known to his brothers, and in his feeling that all his wonderful success was still incomplete until he could send and tell his father, "The Lord has made me master of all the land of Egypt." Joseph, in all his grandeur, is unchanged. When his old peasant father arrives, Joseph is proud to take him to the Pharaoh himself. Joseph had two sons, Ephraim and Manasseh, who became the fathers of the two tribes that bore their names.

Efforts have been made to identify Joseph and the events of his time with known historic incidents. There has been no success.

Thomas Mann's great series of volumes on the story of Joseph and his brothers is one of the most famous novels of our age. W.A.I.

See also BENJAMIN; GENESIS; JACOB; PHARAOH.

JOSEPH BONAPARTE, king of Spain. See BONAPARTE.

JOSEPHINE (1763-1814) was the beloved wife of the most important figure in modern French history, Napoleon Bonaparte. Josephine was the daughter of a French planter in Martinique, in the West Indies. At the age of seventeen she married Viscount Alexandre Beauharnais. They had a son, Eugène, and a daughter, Hortense. The viscount was one of the last victims of the Reign of Terror of the French Revolution. Josephine was also in prison for a time and narrowly escaped being killed on the guillotine herself.

Vis. Ed. Serv.

Josephine, the wife of Napoleon Bonaparte

But she soon became friendly with Viscount Paul Barras, one of the leaders of the government at the time. Through his influence, she got back some of her husband's property, and she became a leader in the fashionable society of Paris. It was at Barras' home that Josephine met Napoleon. He immediately fell in love with her, and they were married in 1796.

Josephine was a beautiful woman, and her marriage with Napoleon naturally made her a subject of gossip. It was often reported that she had love affairs with other men while Napoleon was absent from Paris during his military campaigns. Such reports frequently reached Napoleon and made him very angry. There are also many stories about her influence over her husband, but the truth of most of them is hard to prove.

Undoubtedly Napoleon found much joy and relaxation in her companionship. She was an intelligent woman, and may have given him considerable advice. It is certain that she was graceful and stately in her public appearances, which made her an asset to Napoleon in his climb to be emperor. When Napoleon was crowned emperor, Josephine came down from her throne to kneel at the altar before her husband. He took the little crown in his hands, placed it on his own head, then on hers. He lifted it off once or twice in a playful manner, as if to tell her that she should wear it lightly.

Visual Education Service

Josephine Kneeling at the Feet of Her Husband, Napoleon Bonaparte. This event took place when Napoleon was crowned emperor of France. Napoleon holds the crown in his hands and is about to place it on the head of Josephine.

Napoleon and Josephine had no children. By 1809, Napoleon was afraid that he might die without a son, and that his empire would crumble. He finally decided he would have to divorce Josephine. One night after dinner he told her of his decision as gently as he could. They said their last goodbyes. The empress begged her husband not to forget her. She promised to care for her health, and never to doubt his love. She retired with imperial honors to Malmaison, the small estate near Paris which Napoleon had bought for her.

Napoleon married Marie Louise of Austria in 1810. A year later, a son was born to them. Josephine heard the cannon shots announcing the birth, and called her household together. She said, "We, too, must rejoice. I will give you a ball, and the whole city will be glad with us." Soon after, Napoleon brought his son to Malmaison without Marie Louise's knowledge. Josephine had begged to see him.

Marie Louise was not allowed to go with Napoleon to exile at Elba. Josephine wrote a letter to Napoleon, and asked permission to join him. He was forced to write back that it was impossible. But before his letter arrived, Josephine had died. E.McI.

See also MARIE LOUISE; NAPOLEON I.

JOSEPHINE, LAKE. See UNITED STATES OF AMERICA (color plate, Scenic National Parks and Playgrounds [Glacier National Park]).

JOSEPH OF ARIMATHEA was a Jew who went boldly to Pilate after the Crucifixion and asked for the body of Jesus. He wished to lay it in his own new tomb, which had been cut out of the rock (Matt. 27:60). Joseph is described as a rich councilor. Perhaps he was a member of the Sanhedrin, the high council of the Jews. He was a secret follower of Jesus. He did not vote in favor of putting Jesus to death, but he was afraid to profess himself a disciple of Jesus before the Crucifixion. There is a legend that Joseph kept the cup that Jesus used at the Last Supper and carried it to England. See HOLY GRAIL. F.C.G. and F.J.S.

JOSEPHUS, *joh SE fus*, **FLAVIUS** (A.D. 37-100?), was a Jewish historian whose name was originally Joseph ben Matthias. His most important work, *Jewish Antiquities*, is a twenty-volume history of his people from their beginnings to the close of Nero's reign. Josephus was called the Hebrew Livy because of the character, elegance, and size of his works.

Josephus was born in Jerusalem. He was of royal and priestly descent and was related to the Maccabean house. Shortly before war broke out between the Jews and the Romans in A.D. 66, he was appointed governor of Galilee, which he unsuccessfully defended against the Romans under Vespasian.

Josephus remained with the Roman army as a semi-prisoner for about three years, and saw the siege and fall of Jerusalem in A.D. 70. He then went to Rome with Vespasian, where he gained favor with the emperor and took his Latinized name of Flavius Josephus. J.W.Sw.

See also MACCABEES.

His Works include *History of the Jewish War*, in seven books, written both in Aramaic and Greek; a defense of the Jews, *Against Apion;* and an *Autobiography*.

JOSHUA was a personal attendant of Moses and was leader of Israel after him. After Moses' death he led the Israelite armies across the Jordan. In a swift campaign they captured all of Palestine and killed most of its inhabitants. Then the territory was divided among the Twelve Tribes. In his old age Joshua gathered all Israel about him in a solemn ceremony. There his people renewed their promise of faithfulness to their national God.

This is the story given in the Book of Joshua, but the Book of Judges tells quite a different story. It suggests that the conquest was slow, confused, and not complete. A tablet of the time of the Hebrew conquest bears the name of an invader called Joshua. Some believe the invader to be the Biblical Joshua.

The book of Joshua is the sixth of the Old Testament. Its hero is Joshua, the conqueror of Palestine. It has thrilling descriptions of the capture of Jericho and the overthrow of the five kings. At one time the sun and moon stood still so that Joshua might finish scattering and killing his foes. The book was written by several persons. Some of it was written at a late period. But it does preserve some valid traditions. W.A.I.

JOSHUA TREE. See NATIONAL MONUMENT; YUCCA.

JOSIAH, *joh SI ah*, was one of the last and best kings of Judah. He ruled from 638 to 608 B.C. Josiah came to the throne at the age of eight. His father Amon had been killed after a rule of two years. In the eighteenth year of Josiah's reign, a book of law was found while the Temple was being repaired. The king used this book as his guide in carrying out religious reform. It is believed that a large part of the Book of Deuteronomy came from the book found in the Temple.

Great events were taking place in the world when Josiah came to the throne. The mighty Assyrian Empire was beginning to fall. In 625 B.C. Babylonia broke away and established its freedom. Assyria was soon too weak to exact the tribute it had collected for a hundred years past. Judah appears to have come out peacefully under Josiah into independence.

In 612 B.C. Nineveh was captured by an allied army of Babylonians and Medes. A sense of relief was felt throughout all the Near East. But Pharaoh Necho of Egypt led his army into Palestine and Syria in 608 B.C. He thought the time had come for Egypt to claim these lands again. On the way he met Josiah at Megiddo. What Josiah had to say about his aggression did not please him and Necho had him put to death. W.A.I.

JOTHAM, in the Bible, was the youngest son of Gideon. All his brothers were killed by Abimelech, a Philistine king. His story is told in Judges 9:7-16.

JOUETT, MATTHEW HARRIS. See KENTUCKY (Famous Kentuckians).

JOULE, *jool*, is a unit of energy in physics. It was named for the British scientist, James P. Joule. One joule of energy is equal to about .738 foot-pound of energy, or about 10,000,000 ergs. It is about equal to the energy needed to send an electric current of one ampere down a circuit of one ohm resistance for one second.

It became a legal unit of measure by act of Congress in 1894. The joule is too small an amount of energy for commercial measurement, and kilowatt hours are used instead. E.A.FE.

See also JOULE, JAMES PRESCOTT; WATT.

JOULE, JAMES PRESCOTT (1818-1889), was an English physicist. His most noted discovery was the law of the conservation of energy, which he made at about the same time as Julius von Mayer. This law states that whenever energy is used up in one form it is never lost but always appears again in another form. Joule made this discovery after experiments in which he proved that when work is done by machines or by an electrical current, a proportionate amount of heat always appears.

Scientists credit Joule with having done more than any other man to establish the fundamental theories of energy, and the idea that heat is a form of energy. The *joule*, a unit of work or energy, is named for him.

Joule was born in Salford, and studied under the physicist, John Dalton. R.D.R.

See also HEAT (How Heat is Created); JOULE.

JOURNAL. See BOOKKEEPING.

JOURNALESE is a style of writing developed chiefly by newspapermen in the United States. It came into use after high-speed printing presses and other mechanical improvements were introduced and the preparation of news stories became a matter of haste. Newspapermen often have little time in which to write a story, and so they depend on stock phrases, trite words, and expressions called colloquialisms, which are usually limited to common speech. Journalese is not a writing style to admire or to copy. Most newspapers of the present day urge their writers to avoid journalese, and to write in good English instead. Journalese indicates haste, sloppy thinking, or laziness on the part of the writer.

In the following example, the first version is written in the style of journalese, while the second is in proper English:

Washington, Jan. 25.—The President cracked down on the solons of Capitol Hill today in a statement tipping off the Senators that he would turn executive thumbs down on the new tax bill if it cleared the legislative hopper.

Washington, Jan. 25—The President today warned the Senate that he would veto the new tax bill if the measure were adopted by that body. E.L.THR.

JOURNALISM. Great statesmen argue international issues. A scientist discovers a new element. A small child is killed in a traffic accident. None of these events gets by the journalist. Journalism is the profession of recording such events as may be of interest to the general public.

Almost all the world will be interested in the doings of the statesmen and the scientist. Probably only the people of one community will be interested in the death of the child. Journalism is, therefore, both world-wide in scope and as limited as the territory covered by the smallest country weekly newspaper.

Modern journalism uses every means of communication to report the news of the world to newspapers, magazines, and the news rooms of radio networks. Press associations maintain correspondents in all parts of the world, and receive news from them by radio, underseas cable, telegraph, and transoceanic telephone. Large newspapers have their own foreign correspondents, and keep up news bureaus in the principal cities of the nation. Almost every daily newspaper keeps a staff of reporters assigned to watch for news of various aspects of community life.

The men and women who are engaged in this tremendous newsgathering task rarely call themselves journalists. They think of themselves as newspapermen and newspaperwomen, or as magazine writers or editors. Newspapermen have an especial scorn for the term *journalist*. They love to quote an old saying that "a journalist is a newspaper man with a cane." Yet most of them accept the term journalism for their profession of which they are very proud, in spite of its often demanding requirements in time and labor.

Journalism, especially in modern times, is not a leisurely profession. The tasks of most journalists are tense, sometimes exciting, but more often made up of long hours of hard physical and mental labor.

Journalism was hardly a profession until 1760. Up to that time, news pamphlets of the day contained little more than political propaganda and court gossip. They were published by political parties and written chiefly by printers and political party hack writers. But between 1760 and 1770, freedom of speech became the privilege of most English-speaking countries, and newspapers and journals became more independent. This move toward a free press was aided by the Revolutionary War in America, the French Revolution, and the fight for freedom of the press waged in England by John Wilkes and Henry Woodfall. When the London *Times* sent correspondents to the European continent to report the Napoleonic Wars, it marked the first time that a war was reported directly to the people by persons not concerned with the fighting.

In the United States during the 1850's great individual leaders arose in the field of journalism. These were famous molders of public opinion such as Horace Greeley, Charles Dana, and William Cullen Bryant, James Gordon Bennett, and Joseph Pulitzer. In this period the founding of the "penny press" made newspapers available to the common man, and information came into the public domain.

During the 1900's the progress of journalism was steady both mechanically and professionally. The educational requirements for journalists were raised, and such inventions as the high-speed press, the automatic teletype, and similar devices helped the journalist to transmit news more speedily and freely.

Journalists at Work

The Newspaper branch of the journalistic profession is probably the most exciting and adventuresome of all. Because of this, it attracts most young persons who wish to become journalists. Newspaper workers have the satisfaction of seeing their work in print either the same day it is written or the day following. The work of most newspaper writers throws them in contact with humanity in all its forms. Those who gather and prepare the news, either as reporters or special writers, meet many kinds of people. A reporter may have consultations with the mayor of his city, a special writer may interview the famous author he has always admired, and a foreign correspondent may talk to a king. This direct contact with the powerful and the famous persons of the world offers a fascination which leads many newspaper workers to value their profession above any other, even though they work long and unusual hours, under conditions that are sometimes very trying. Even those who work inside the newspaper office as writers or editors gain satisfaction from their close contact with public affairs.

The *reporter* is the person who gathers the news at its source. Reporters are the "shock troops" of a newspaper or press association. They go to the spot where the news is happening and assemble the facts for the news story. This is not easy as it may sound. Any newspaper editor knows that an apprentice, or *cub reporter*, is not likely to come back with the facts and details that a well-trained and experienced reporter would. News stories are often likely to be uncomplimentary to the person involved. The reporter, therefore, must be a good psychologist. He must be able to get people to talk about things they do not want to talk about. For example, by expert questioning, a reporter may often get city officials to admit some abuse of their power or some mistake in administration of public affairs.

Like all newspapermen, the reporter must have what is called a "nose for news." There are classic stories within the profession about the lack of this faculty, and newspapermen like to tell about them after working hours. One is the story of the cub reporter sent to cover a public meeting. He returned to inform his editor there was "no story," because the meeting hall had burned down and the speaker and several persons in the audience were injured. This, of course, would have been a better story than any which could have come out of the meeting had it been held.

Getting the facts accurately is another important requirement of a good reporter. Mistakes in fact, or misquoting what persons have told him, can not only be embarrassing to his paper, but may result in an expensive lawsuit if his error has violated the libel laws.

Many good reporters, especially on large newspapers, do not possess any great writing ability. They are known as "leg men," and are valuable to their paper because of their skill and ingenuity in digging up facts in difficult situations. These facts are then telephoned to the newspaper. For the most part, however, the young reporter

who wishes to succeed will develop an ability to write clearly, concisely, and in an entertaining and colorful manner. This will enable him to take the next step upward in his profession, and become either a rewrite man or a special writer.

The *rewrite man* is more highly paid than most reporters. This is because he must be able to write well, accurately, and at high speed. He may often have only a few minutes in which to turn out an important story before his paper goes on the presses. The rewrite man rarely leaves the office, except for an occasional out-of-town assignment. Most of his work involves taking stories from reporters by telephone and writing them. He must be able to analyze the facts he has been told, and ask the reporter to supply any missing details. If he fails to do so before he loses contact with the reporter, he may not be able to obtain them later. Rewrite men must know a great deal about their city, for they are often called upon to get the facts of the story by telephone when there is no time to send out reporters.

The rewrite man must also be able to take publicity material which the newspaper wishes to publish and rewrite it in such a fashion as to be entertaining as well as informative. Often such publicity "handouts" contain information which in its original form would not be likely to be read because it is written in such a dull fashion. The rewrite man will be asked by his editor to "breathe some life into this." He will then interpret the facts in such a way that the interesting facts and the human elements of the story are brought out clearly.

On a straight news story, called *spot news*, the rewrite man follows certain fundamental principles of all good newspaper writing. He is careful to see that his story answers these five questions: "Who?" "What?" "Where?" "When?" and "Why?" Even the shortest story should contain this information. For example, these questions are answered in the following typical news story:

John Jones, 55 years old, of 115 West 58th Street, (*who*) died (*what*) late yesterday (*when*) after he slipped on ice, fell, and struck his head against the curb (*why*) at the corner of Spruce and Pine streets (*where*).

The rewrite man organizes his story carefully so that the important facts come in the first paragraph, called the *lead*. The rule on most newspapers is to "tell the story in the first paragraph."

The rest of the facts are set down by the rewrite man in the order of their importance, so that the story can be reduced in length, or cut, from the bottom, if space requires, without losing the most essential facts.

The *feature writer* need not follow these fundamental rules for the spot news story. Feature writers are usually newspapermen with an exceptional ability for colorful writing. They may be assigned to interview persons with unusual hobbies, write an amusing story about the birth of a hippopotamus at the city zoo, or tell the history of some old building landmark of the city which is being torn down. All of these are examples of feature stories, and the feature writer writes them in his own way. He may even save the most important fact for the last part as a "surprise ending," since it is assumed that his story will be interesting enough for the average reader to follow it straight through. Such stories are often written by *general assignment reporters*, who may also be called upon to cover spot news stories. Feature stories often carry the name, or *by-line*, of the writer.

The *copyreader* is one of the most important persons on a newspaper. To most people who visit a newspaper plant, the solemn-faced men who sit around a great horseshoe-shaped desk and work over copy with busy pencils are not romantic figures. Yet most of these copyreaders would not willingly trade places with any of the reporters or feature writers. The grist of the day's news passes through their hands to be checked for grammar, spelling, punctuation, and the style of the particular newspaper. Often they are asked to trim stories to fit space requirements, a task that requires skill in order to retain all the essential facts of the story in fewer words. After they have given the story its final polish, the copyreader writes a headline for the article. The headline must tell the story as dramatically as possible, but must not depart from the facts. "CITY'S LARGEST FACTORY EXPLODES" is not a truthful headline when the facts are that a minor explosion has occurred in a small storage building on the factory's grounds. Such headline writing is not only a violation of news ethics, but also serves to annoy the reader when he buys a paper on the strength of the exaggerated headline.

Special Assignments on a newspaper often bring higher pay to the journalist, although they also require special training or ability.

The *editorial writer* prepares the editorials which reflect the political opinions of his newspaper. See EDITORIAL.

The *political writer*, or *political editor*, covers the political affairs of the community, and analyzes elections both before and after they are held.

The *foreign correspondent* is one of the most glamorous figures in the newspaper profession. He travels over the world, wherever foreign news is most prominent, and reports to his paper by cable or radio. In wartime, the foreign correspondent's job is a dangerous one. During World War II several war correspondents were killed while on missions for their papers. Many war correspondents went into battle action with units of the army, navy, and marine corps. See WAR CORRESPONDENTS.

The *columnist* is a special writer who is assigned a certain space in the paper, sometimes daily and sometimes only two or three times a week. Most columnist have their specialty. Some are humorists, some discuss current events, some are the "gossip" columnists who discuss personalities and events in their community. Columnists whose writing appears in hundreds of newspapers throughout the nation are the most highly paid journalists in the profession. Often they earn much more than their editors. Many local newspapers also have columnists who have a wide circle of readers within their community.

The *drama*, *music*, and *motion-picture critics* are envied newspaper persons because they get free tickets to entertainment performances. The duty of the critic, or *reviewer*, is to judge the quality of a particular performance for the guidance of the public.

The *financial editor* is in charge of reports of the stock-market price tables and various other market quotations carried by his newspaper. In addition, he may

write a daily column about general business affairs, and news stories about various businesses.

The *sports editor* is one of the most widely read contributors to any newspaper. On large newspapers the sports editor has several assistants to help him report and comment on sports events.

The *aviation editor* and the *auto editor* are examples of special writers used by newspapers and magazines to report developments in industries which are of especial interest to the public.

The *science editor* is a special journalist of increasing importance because of great public interest in new developments in various scientific fields.

The *society editor* prepares news of engagements, weddings, and various social functions among the people of the community who are regarded as "society." This job is usually handled by a woman, although there have been several society editors who were men.

The *picture editor* has become increasingly important on the modern newspaper, especially on the small-sized papers called *tabloids*. The picture editor must be a good judge of news pictures. The average newspaper has a picture page on which groups of photos are arranged in a *layout*. The picture editor usually is responsible for seeing that this page has balance and human interest.

Photographers work with the picture editor, covering the city and surrounding territory to obtain pictures in much the same fashion as the reporters obtain their news. Photographers usually accompany the reporter on a story of importance, so that the story may be covered from both angles. In a few instances, newspapers have employed *reporter-photographers*, or men who are able to cover the story and take the pictures as well. Some of these men were reporters who learned how to operate the complicated speedflash news camera, while others were photographers whose educational background or general aptitude enabled them to be good reporters as well.

Newspaper Department Heads are those who supervise the work of the editorial employees in various departments. Most of them have worked up from the ranks of regular newspaper employees. The *city editor* assigns the reporters to their news beats. The *news editor* selects the various stories received from the city desk and from other parts of the world by press association wire and determines the place and space they will occupy in the paper. The *copy desk chief* supervises the work of the copyreaders.

The department heads work under the supervision of a *managing editor*, who may have one or more assistants.

Workers on News Magazines and Other Journals. The growth of news magazines and trade publications has opened up many opportunities for those who wish to enter the field of journalism. Many newspaper workers have been drawn quite naturally into the news magazine field, since the purpose of the news periodical is to gather together and summarize the daily news of the previous week or month. The trade publications of industries, professions, and other special groups also have attracted former newspapermen. The lines between jobs on these journals are not quite so clearly drawn as they are on the newspaper. But these publications usually have staff correspondents in the larger cities, special writers who are assigned to cover more important matters, and various editors who work in the publication offices.

Journalism in Radio. During the 1930's a new kind of journalist, the radio *news commentator*, or *newscaster*, appeared in the profession. These are men and women whose job it is to sift the day's news for the most important items, and broadcast them in interesting fashion. The news commentator may be employed by a local station, or he may broadcast to the nation over one of the large radio chains. The large networks have radio news rooms in which editors prepare news scripts for the announcers' news reports received by wire from the same press associations which serve newspapers. Most of the persons engaged in radio news work had their early background in the newspaper business. During World War II the radio chains sent correspondents to the various theaters of war. Their reports of the war were heard over the radios of millions of civilians on the home front.

Education in Journalism

An argument is waged freely between editors of equally high standing as to whether it is better for the young person who aspires to become a journalist to study for the profession in a school of journalism, or to gain a liberal education in a college of the arts. Some editors prefer to hire young men and women with general high school and college training, and give them an apprenticeship training on the newspaper or magazine. In the United States, this training usually begins with a job as a copy boy or girl. This is a job which compares with an office boy's position in the average business office. The copy boy's job is a lowly one, involving many errands, but the job offers an excellent opportunity to learn all phases of the work.

Schools of Journalism. Many persons have reached high places in journalism with little or no formal education. But there is a growing belief that the young journalist is better prepared for his career if he attends a school of journalism. These schools have increased their reputations since they have begun to employ well-educated newspapermen as instructors.

Joseph Pulitzer, publisher of the old *New York World*, was one of the first publishers to recognize the value of formal education in the field of journalism. In 1904 Pulitzer endowed the Columbia University School of Journalism, now one of the most famous in the world. Other well-known schools of journalism include those maintained by Northwestern University, the University of Wisconsin, the University of Missouri, Indiana University, the University of Illinois, Ohio State University, and Stanford University. Hundreds of other colleges and universities have departments of journalism. Many of them operate daily newspapers which give the students actual practice in the mechanics of journalism.

Ethics and Traditions

The highest ideals of any profession are contained in its code of ethics. In the medical and legal professions, ethics are so highly developed and so clearly outlined that violations may cause a doctor or a lawyer to lose his practice. Journalism has gone a long way toward developing high standards, but as a whole the profession has not yet developed the means of enforcing these standards or of taking any action against members of the profession who violate them. Only the British Institute of Journalists and the Australian Journalists' Union have developed means by which a member of their profession may be barred for unethical practices in the same fashion as doctors and lawyers.

In the United States each journalist polices himself. But nevertheless, a standard of ethical conduct has been set up which is followed, for the most part, by the majority of working newspapermen and magazine and journal workers.

Probably the most fundamental of journalistic ethics is contained in the principle that "there are two sides to every story." Whether the ethical journalist covers, writes, or edits a story, he has this principle in mind. Newspapers and magazines opposed to labor unions have often instructed reporters and writers to "cover" strikes by getting facts only from representatives of management. The workers' side of the picture was then either ignored or deliberately misstated. On the other hand, publications which favor labor may give only the union's side of the strike, ignoring any justification there may be for the actions of management.

One of the strongest ethical traditions of journalism is never to violate a confidence. Sometimes a story is given to a journalist by a person who exacts a promise that the source of the story will not be revealed. Ethical journalists have resisted all kinds of pressure to get them to tell the source of their story. There have been instances when journalists refused to tell their editors or their publishers, and have even gone to jail for refusing to reveal the source to a court of law.

The "off-the-record" confidence is one which most public officials have come to recognize as a fundamental part of American journalism. When a person tells a journalist something "off the record," he can almost always be assured that the information will not be published unless he gives permission.

There have been instances where confidences have been violated, but not many. During World War II, several newspapermen released information in violation of military and naval censorship. The tradition of freedom of the press saved these men from punishment, although their releases actually might have endangered the security of the nation.

In the United States, vulgarity and sensationalism have been stumbling blocks to attaining the highest standards of journalism. Such practices have been given the name "yellow journalism." This type of journalism may blacken the character of individuals through distorted or completely false news stories, violate the privacy of individuals in order to secure sensational stories which have little actual news value, and run stories and pictures which are just short of being indecent.

Vocational Opportunities

The salary of the average journalist is not high. It falls below the average income of doctors and lawyers, but is above the average income of teachers. Some special writers get as much as $500 a week, and many columnists whose writings are syndicated (printed in many papers) receive from $40,000 to $100,000 a year. The salary scales for the workers on newspapers, press associations, and some news magazines has steadily improved since 1934, when the American Newspaper Guild, a national labor union affiliated with the Congress of Industrial Organizations, was organized. This organization, and a number of local newspaper unions affiliated with the American Federation of Labor, have done much to secure higher basic wages and better working conditions for the profession. Like most other occupations, there are also positions open for accountants in the field of journalism. Artists and cartoonists also can find employment in journalism.

The most sought-for awards in the field of journalism are the Pulitzer prizes. Six may be awarded in newspaper work each year. They are given for outstanding public service, good reporting, superior Washington or foreign correspondence, editorial writing, cartooning, and photography. These prizes range from $500 to $1,000.

Another coveted prize in journalism is the Heywood Broun Memorial Award, given each year to the newspaperman who performed some outstanding service in the spirit of Heywood Broun, a famous columnist for many years. The award, a $250 U.S. Savings bond and a guild citation, is presented by members of the American Newspaper Guild, of which Broun was a founder.

Journalists who wish to specialize in some particular field may apply for the Nieman Fellowships, which are awarded every year by Harvard University.

Famous Journalists

The first men to give rise to the term *journalism* are still regarded as having been among the leaders of the profession. They include Joseph Addison, Richard Steele, Jonathan Swift, Daniel Defoe, and Samuel Johnson. These men were frequent contributors to English magazines during the 1600's and 1700's. In addition most of them wrote forceful pamphlets about their views on public affairs. They differed from the writers of their time in that they did not confine their writing to published books, but also wrote a great deal for journals. During the 1800's, W. E. Henley was a leader among English journalists.

In the United States, newspapers began to be published successfully during the 1700's. Men who became important journalists during that time were John Campbell, publisher of the *Boston News-Letter;* James Franklin, brother of Benjamin Franklin and publisher of the *New-England Courant;* and Benjamin Towne, who began his *Pennsylvania Evening Post* in 1775.

Journalists who started a colorful era in the newspaper field during the 1800's included William Cullen Bryant, editor of the *New York Evening Post;* Charles Dana, founder of the *New York Sun;* James Gordon Bennett, editor of the *New York Herald;* Horace Greeley, editor of the *New York Tribune;* and Joseph Pulitzer, founder of the *New York Evening World*. This was the period of "personal journalism," when each publisher wrote his own editorials and criticized his fellow publishers in strong language. The personal journalist was not confined to the large cities, however. In Emporia, Kan., William Allen White achieved nation-wide fame for his editorials in the *Emporia Gazette*.

The 1900's saw the coming of the "chain paper" publishers. The most outstanding of these were E. W. Scripps, founder of the Scripps-Howard chain, and William Randolph Hearst. Hearst became a real power in American journalism and politics during the earlier days of the Hearst chain.

The writers and correspondents of the early papers were even more famous than the publisher-journalists in many instances. Richard Harding Davis was one of the most colorful war correspondents to capture the public imagination of his time. Davis covered the Spanish-American, the Boer, and the Russo-Japanese wars, and the early part of World War I. Floyd Gibbons, another famous war correspondent of World War I, later became prominent for many years as a radio commentator.

During World War II many newspapermen achieved fame as war correspondents. The most notable was Ernie Pyle, whose sympathy toward the enlisted men of the fighting forces earned him the name of "the common man's war correspondent." Pyle was shot by a Japanese while on a mission with United States forces on a small island off Okinawa. E.L.THR.

Related Subjects. The reader is referred to the BIOGRAPHY section of the READING AND STUDY GUIDE for a list of journalists whose biographies appear in THE WORLD BOOK ENCYCLOPEDIA. See also:

Editorial	Press Association
Fourth Estate	Publishing
Magazine	Pulitzer Prizes
Newspaper (with list)	

Books for Younger Readers

BURT, OLIVE W. *Peter's Story Goes to Press.* Holt, 1944. Steps in publishing a paper described and illustrated.

FLOHERTY, JOHN JOSEPH. *Your Daily Paper.* Lippincott, 1939. Explains how a newspaper is produced.

JACKSON, JOSEPH HENRY. *Extra! Extra!* Macmillan, 1940. Step-by-step account, with many illustrations, of how a city newspaper gets out an extra edition.

Books for Older Readers

DALE, EDGAR. *How to Read a Newspaper.* Scott, 1941. The purpose of this book is to train intelligent newspaper readers.

FENTON, ALFRED H. *Dana of the Sun.* Farrar, 1941. Biography of the famous editor of the *New York Sun*, written for young people.

GRAMLING, OLIVER. *AP, the Story of News.* Farrar, 1940. History of the Associated Press.

LEE, ALFRED MCCLUNG. *Daily Newspaper in America.* Macmillan, 1937. History of newspapers.

MCNAMARA, JOHN. *Extra! U.S. War Correspondents in Action.* Houghton, 1945. War correspondents from 1861 to 1945.

RAE, WALTER. *Editing Small Newspapers; a Handbook for Young Journalists.* Mill, 1943. Information on how to run a high-school paper or a small-town weekly.

SELDES, GEORGE. *Lords of the Press.* Messner, 1938. Discussion of leading persons in the newspaper world.

WHIPPLE, LEON. *How to Understand Current Events; a Guide to an Appraisal of the News.* Harper, 1941.

JOURNALISM, SCHOOLS OF. See JOURNALISM.

JOURNALIST. See list of Editors and Journalists in the BIOGRAPHY section of the READING AND STUDY GUIDE.

JOURNEYMAN. See APPRENTICE; GUILD.

JOUST. See KNIGHTS AND KNIGHTHOOD.

JOYCE, JAMES (1882-1941), was one of the most original writers of modern times. His works aroused both high praise and loud ridicule. Joyce developed to its greatest extreme the "stream of consciousness" style of writing, for which Gertrude Stein and Virginia Woolf are also noted. In such books as *Ulysses* and *Finnegans Wake*, Joyce attempted to show the exact thoughts that move through one man's mind. *Ulysses* was the record of one day, and *Finnegans Wake* the record of one night. This style required the writer to use many unusual words and sentence forms.

Joyce's style made his works very difficult for many people to read and understand. His works were also attacked as being immoral. The publication of *Ulysses* was forbidden in the United States for many years. Joyce's first work, *The Dubliners*, was written in 1904, but was not published until 1914 because it was thought immoral. But admirers of Joyce have called his writing "the most massive, inclusive, eloquent statement of Europe's intellectual and moral chaos."

Joyce was born in Dublin, Ireland, where he was educated at University College. He spent most of his adult life in France, where his writings were received with more sympathy than in Ireland. S.M.S.

His Works include *A Portrait of the Artist as a Young Man; Exiles;* and *Chamber Music*, a book of poems.

JUAN, *hwahn*, **DON.** See DON JUAN.

JUANA INÉS DE LA CRUZ, *HWAH nah ee NAYS day lah KROOS*, **SISTER** (1651-1695), was a Mexican nun and poet. She composed her first poem at the age of eight. At the age of seventeen, her learning and intelligence won the admiration of a group of learned men who were called to examine her. Her work is noted for its grace and depth of feeling. Most of her poems have religious subjects, but she also wrote on other subjects. She was called the Mexican "Tenth Muse."

Juana Inés was born near Mexico City of Spanish parents. She was lady in waiting to the wife of the Spanish viceroy for several years. She entered the convent of San Jeronimo in 1668. V.CO.

JUAN DE FUCA, *HWAHN day FOO kah*, **STRAIT,** is a narrow body of water which separates Vancouver Island, British Columbia, from the state of Washington. The strait, with Puget Sound on the south and Georgia Strait on the north, forms an important waterway through which ships pass to the Pacific Ocean from Seattle, Wash., and Vancouver and Victoria, B.C.

Juan de Fuca Strait is about eighty miles long and ten to eighteen miles wide.

The United States and Great Britain disputed for many years over the ownership of the island of San Juan, at the eastern end of the strait. The dispute was arbitrated by William I, Emperor of Germany, in 1872. William decided the island should belong to the state of Washington. The International Boundary Line runs through Haro Strait, west of the island.

Juan de Fuca Strait was named for a Greek navigator who claimed to have discovered the waterway in the 1500's. His claim was later proved to be false, but the name was kept. H.U.S.

See also PUGET SOUND.

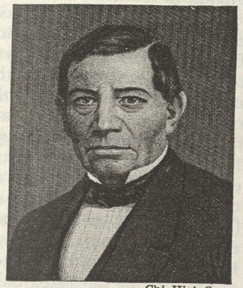
JUAN FERNÁNDEZ, *hwahn fer NAHN dayth*, is the name of three different islands which lie about four

hundred miles west of Chile in the Pacific Ocean. These islands are owned by Chile. They are Mas a Tierra (*landward island*), Santa Clara, and Mas Afuera (*farther-out island*). They have an area of about 70 square miles.

About 300 Spanish-speaking people live on Mas a Tierra, the largest island. They make their living by fishing for lobsters. Mas a Tierra is world-famous as the island where Alexander Selkirk stayed alone for four years (1704-1709). Selkirk's adventures came to the attention of the famous English writer, Daniel Defoe, who used them in writing *Robinson Crusoe*.

The islands were discovered in 1563 by Juan Fernández, a Spanish explorer. Chile gained possession of them in the early 1800's. See also DEFOE, DANIEL; ROBINSON CRUSOE; SELKIRK, ALEXANDER. R.PEA.

JUÁREZ, *HWAH rays*, **BENITO PABLO** (1806-1872), was President of Mexico from 1858 until his death. He gave his country the most liberal government it had before the revolution of 1910. His reform laws marked an important step in the development of Mexico.



Chi. Hist. Soc.

Benito Juárez founded a liberal Mexican government.

Juárez was born in the state of Oaxaca. He was a pure-blooded Zapotec Indian, and his political rise made him a hero of the downtrodden Indians. Juárez was educated in Oaxaca, and became a lawyer. He was elected governor of Oaxaca in 1847, and won attention in 1855 with the Juárez Law. This law cut down the authority of the Roman Catholic Church in affairs of state. He also helped frame the constitution of 1857.

Juárez was elected President in 1858. Mexican financial difficulties forced Juárez to stop payment on public debt for two years. As a result, the French set up an empire under Maximilian I.

Juárez was forced to move to northern Mexico, where he kept up a stubborn resistance to the French. When the United States demanded the withdrawal of French troops, Maximilian lost his support in Europe. Juárez recaptured the country in 1867. See also MAXIMILIAN; MEXICO (History). T.R.Y.

JUBAL, *JOO bal*. See HARP.

JUBILEE, *JOO bih lee*, is a celebration on the twenty-fifth or fiftieth anniversary of an important event. Jubilees are usually celebrated by nations. King George V of England celebrated his twenty-fifth year of rule with a jubilee. The Roman Catholic Church holds jubilees every twenty-five years and on special occasions proclaimed by the Pope.

The word *jubilee* comes from an ancient Hebrew word which means *ram's horn*, or *trumpet*. According to Hebrew law, a year of atonement and rejoicing was proclaimed every fiftieth year. E.H.SE.

JUDAH, in the Old Testament, was the fourth son of Jacob. The story of his life is found in Genesis 29 to 49. It was Judah who kept his brother Joseph from being killed. He suggested instead that Joseph be sold to the Ishmaelites as a slave. Judah also obtained Jacob's consent to let Benjamin go back with the brothers to Egypt, and pleaded before Joseph for Benjamin. Phares, one of the five sons of Judah, is said to be an ancestor of the Messiah. W.A.I.

JUDAH ha-LEVI, *YOO dah hah-LAY vee* (1085?-1140?), was the greatest Hebrew poet of the Middle Ages. His poetry included both national and religious songs, and often dealt with the suffering of the Jewish people. Many of his hymns are now used in Jewish religious services. Judah was born in Toledo, Spain, and studied medicine and Jewish religious teachings, as well as philosophy. He became both a rabbi and a physician. His most important work in philosophy was *Sefer ha-Kuzari*, which defended Judaism. G.S.B.

JUDAISM is the religion of the Jews. It was probably the first religion to teach belief in One God. Even though they are different in many ways, both Christianity and Islam are based on Judaism.

We know most about Judaism from the Bible, especially the Old Testament. The Pentateuch, or the first five books of the Bible, contains most of the important teachings and laws of the Jewish faith. The Hebrew name for these books is *Torah*. Two of the outstanding teachings of the Torah are "Thou shalt love thy neighbor as thyself" (Leviticus 19:18) and the Ten Commandments.

Much of the Jewish religion is contained in other books besides the Torah. The great ethical teachings of the Prophets like Isaiah and Jeremiah are important parts of Judaism. So are the poetic books of the Psalms and Job, and all the other Old Testament books.

The Jews received the Torah in about 1400 B.C. They studied it earnestly for many hundreds of years. Their religious leaders, called *rabbis*, explained and interpreted the teachings of the Torah to the people. They applied its general laws to the problems of everyday life. The rabbis also passed new laws which they thought were necessary to preserve the spirit of the Torah. Finally these teachings and laws were written down in a group of books called the *Talmud*. *Talmud* simply means *teaching*. The Talmud took several hundred years to complete. It was finally finished in about the year 500 A.D. One of the important sayings in the Talmud is that of the sage, Hillel. He declared that the basic principle of the Torah is, "What is hateful unto thyself do not do unto thy fellowman."

Many Jews believe in the coming of a Messiah who will usher in the golden age of God's kingdom on earth. Nevertheless, Judaism teaches that all men must work actively for social justice, world peace, and brotherhood among nations.

There are three groups within the Jewish faith: the Orthodox, the Conservative, and the Reform. These groups accept all the ethical, social, and moral principles of Judaism. But they differ somewhat in their observance of the ceremonial and ritual laws.

Orthodox Judaism keeps strictly to the traditional ceremonial regulations as found in the Bible, the Talmud, and the later books of the rabbis.

Conservative Judaism recognizes the authority of Jewish ritual law, but has adopted a number of important modifications in actual practice.

Reform Judaism lays less stress on the ceremonial and ritual observances than either Conservative or Orthodox Judaism. It emphasizes the social, moral, and ethical precepts upon which the Prophets insisted, considering the spirit of the faith even more important than the letter.

A Jewish House of Worship is known as a synagogue or a temple. Many of the prayers in the synagogue, as in the church, are taken from the book of Psalms. A *cantor*, or reader, and a choir join with the congregation in reciting the synagogue services. Sometimes they are chanted or sung in Hebrew, the language in which they were first written. But very often prayers are recited in English so that all can take part in the services. There are many other synagogue prayers besides the Psalms. But the purpose of all is to bring Jews closer to God and to their fellowmen.

Jewish Holidays. The Jewish Sabbath begins at sunset Friday evening and lasts until sunset Saturday. Worship services are held in the synagogue on Friday at sundown and Saturday morning and afternoon. In modern times, many synagogues have instituted late Friday evening services, while some temples have introduced Sunday morning sessions in addition to the regular Saturday morning worship.

The *Sabbath* is observed by abstaining from physical labor. It is also marked by worship, and study.

The two most important Jewish religious holidays are *Rosh Hashanah*, New Year's Day, and *Yom Kippur*, the Day of Atonement. These High Holidays are celebrated in the autumn. According to Jewish tradition, Rosh Hashanah is the day on which God passes judgment upon mankind. So on this holiday the Jews pray for forgiveness and for a year of peace and happiness for all the world. One of the most important ceremonies of Rosh Hashanah is the sounding of the *shofar*, or ram's horn. The shofar has a loud and piercing blast and its notes are supposed to call man's attention to the need for living a good life. Rosh Hashanah is the first day of the "Ten Days of Penitence" which end with Yom Kippur. On this solemn day, almost all Jewish men and women do not eat or drink. Even the younger children try to fast for part of the day. The Bible also requires that Jews not perform any kind of work on Yom Kippur. Fasting and not working allow the people to spend the entire day in prayer and worship.

Succoth, the Feast of Tabernacles or Booths, comes five days after Yom Kippur. It is called the "Feast of Booths" because during this holiday week many religious Jews eat their meals and spend part of their time in a *succah*, a little hut covered with leafy branches and twigs. They observe this ceremony to remind them of God's protection of their forefathers in the wilderness when they had only small and unsafe shelters, like these, in which to live. The succah is decorated with vegetables and fruits because Succoth is also a harvest thanksgiving festival. Often the synagogue builds one large succah for the people.

Hanukkah, or the Feast of Dedication, falls in December. It recalls the winning of religious freedom by the Jews in 165 B.C. At that time a small group of patriots under the leadership of Judah the Maccabee defeated the forces of the Syrian emperor, Antiochus Epiphanes. Antiochus had substituted idol worship for worship of the One God and had desecrated the temple in Jerusalem. The Maccabees cleansed the temple and made it once again a place for the worship of God. The holiday is also known as the Feast of Lights, because of the custom of lighting candles on each of the holiday evenings. The head of the family performs the candlelighting ceremony each evening just after nightfall, in the presence of the entire household. On the first evening a single candle is lighted. The number of candles is increased by one each evening until the last night, when the full eight are kindled.

The festival of *Purim* is celebrated during the month of March. The Biblical book of Esther is read in the synagogue from a special scroll or *megillah*. The megillah tells of the deliverance of the Jews from the plot of Haman, prime minister of ancient Persia. The spirit of Purim is one of merrymaking. Presents are given to friends, to relatives, and to the poor.

Passover (*Pesach*), the Festival of Unleavened Bread, commemorates the liberation of the Hebrews from Egyptian bondage. It falls in the spring. The best known of the Passover services is the *Seder* (order of service), conducted in the home on the first two nights of Passover. It is a joyous celebration and the occasion for family reunions. The *Haggadah*, or the story of the flight of the Jewish people from Egypt, is recited. Psalms of praise and thanksgiving are sung. During the Passover week many Jews will eat only unleavened bread (called *Matzoh* in Hebrew) and only such other foods as contain no leaven. In the synagogue services, Passover is termed "the festival of freedom."

Shevuoth, or the Feast of Weeks, is celebrated seven weeks after Passover. The holiday is a harvest thanksgiving festival. On Shevuoth many homes and synagogues are decorated with boughs, flowers, and green foliage. But the holiday is also observed for another important reason. Jewish tradition holds that the Ten Commandments were first presented to the Israelites from Mount Sinai on Shevuoth. (See TEN COMMANDMENTS.) The association of the festival with the giving of the Torah has led to the widespread custom of holding Shevuoth confirmation ceremonies for Jewish girls and boys.

Besides the confirmation services on Shevuoth, most Jewish boys are confirmed in a special service called *bar mitzvah*. This ceremony takes place in the synagogue when a boy reaches the age of thirteen. On the Sabbath nearest his birthday, he is called upon to read a portion of the Torah and a lesson from the prophets.

Reform Jews observe only the first day of such holidays as Rosh Hashanah and Succoth, and the opening and closing days of Passover and Shevuoth. This custom also is followed in Palestine.

Other Ceremonies and Rituals of Judaism are observed in varying degree by Orthodox, Conservative, and Reform Jews. Among the most important is the ceremony of *circumcision*. This is performed on the eighth day after birth. Still another is the observance of the *dietary laws*. These laws are set down in the Bible and further interpreted and extended in the Talmud. They prohibit the eating of all pork products. They also prohibit the eating of beef which has not been slaughtered in a special way intended to lessen the animal's suffering. The dietary laws also require that all meat be freed of its surface blood before being eaten, and that meat and milk foods be kept and served separately. Food prepared in accord with dietary law is termed *kosher*.

The purpose of these and other ceremonies of Judaism is to remind the Jew of his duties and obligation to God and to his fellowmen. I.J.R. and W.F.Ro.

See also ANCIENT CIVILIZATION (Religion and Ethics); JEW (with list of Related Subjects); KOSHER.

JUDAS, JUDE, or **THADDEUS.** See APOSTLE; JUDE, SAINT.

JUDAS, called Iscariot, was one of the twelve apostles of Jesus. The Roman soldiers who came to arrest Jesus did not know Him when they saw Him. Judas betrayed Jesus by kissing Him. Then the soldiers knew who Jesus was. Judas got thirty pieces of silver for this act. One passage in the Bible says Judas gave the money back to the priests who gave it to him, and then hanged himself. Another passage says he bought a field with the money, and then had a bad fall which killed him. A *Judas kiss* means an act that appears to be friendly, but is not. The *Judas tree* is the kind of tree on which Judas is said to have hanged himself. See also APOSTLE. S.M.S.

JUDAS TREE. See REDBUD.

JUDD, CHARLES HUBBARD (1873-1946), was an American psychologist and educator. His studies in how to improve reading ability are particularly well known.

Judd was born in Bareilly, India, and moved to the United States in 1879. He studied at Wesleyan and Yale universities, and the University of Leipzig, Germany. Judd was head of the University of Chicago Department of Education from 1909 to 1938. F.E.C.

JUDE, *jood*, is a short epistle which forms the twenty-sixth book of the New Testament. It is one of seven books called General Epistles because they are letters addressed to Christians in general. Jude (or Judas) is also the name of a brother of James. This *Epistle* is only twenty-five verses long. Its date is not known. In it the author seems to be speaking against the false teachers whom Peter attacked in his second *Epistle*. Jude warns Christians about future judgment by God. F.C.G.

JUDE, SAINT, or **SAINT JUDAS,** was one of the apostles of Jesus. Jude was also known as Judas or Thaddeus. He was not the Judas who betrayed Christ. Roman Catholic belief claims that he wrote the epistle of the New Testament which bears his name. Other authorities say the author is unknown. Saint Jude is the patron of desperate cases, such as those of sufferers from cancer. His feast day is October 28. S.M.S.

Location Map of Judea (Shown in Black)

JUDEA, in the Bible, was the country in the south part of Palestine. It was given its name because the descendants of Jacob's son, Judah, one of the twelve Hebrew patriarchs, settled there.

The location of Judea at the south end of the central Palestine highlands left it exposed to an expanse of desert. Across this desert from the south came many Arab tribes, Kenites, Kenizzites, Calebites, and Jerahmeelites. Judea absorbed these people and their ways.

King David raised Judea to the standing of a kingdom about a thousand years before Christ. The descendants, or dynasty, of David ruled from the time Judea united with Israel until the end of Solomon's reign. The Babylonian king, Nebuchadnezzar, captured Jerusalem and overthrew the kingdom in 586 B.C.

The term *Judean* gradually gave way to *Jewish* after the overthrow of the kingdom. Then Judea, with its capital, Jerusalem, became the center of Jewish life.

JUDGE is the officer who presides in a law court. He sees that court proceedings are carried on according to the law and decides what evidence may be admitted. If persons involved in the case think he has made a mistake, the case may be appealed to a higher court. When there is no jury, the judge decides what the facts are and what law applies to them. When there is a jury, the judge usually rules on questions of law, while the jury decides all questions of fact. In criminal cases, the jury decides whether the accused person is guilty or innocent. The judge decides the sentence according to the law.

Judges in Great Britain and in Canada are appointed by the Crown for life. Federal judges in the United States are appointed for life by the President. Their appointment must be approved by the Senate. State, county, city, and circuit-court judges are elected by the people, usually for a term of six years. In a few states, the people may use the *recall* to put elected judges out of office. Federal judges can be removed from office by impeachment proceedings. Canadian judges may be removed by the Governor General.

The highest judges are called *justices* in both Great Britain and the United States. Justices of the peace and police magistrates are not considered judges, even though they have certain judicial powers. H.CAI.

See also COURT; IMPEACHMENT; RECALL; SENTENCE.

JUDGE ADVOCATE GENERAL'S CORPS is the legal department of the United States Army. The Judge Advocate General is legal advisor to the Army Chief of Staff, the Secretary of the Army, and to other high army officers. He holds the rank of major general. The officers, or judge advocates, in his department are lawyers. They serve as legal advisors on the staffs of the commanders of each army, army corps, division, and certain other units. The Corps reviews courts-martial to see that justice has been done. It also has charge of the legal aspects of the vast real-estate holdings owned or leased by the army. E.CO.

JUDGES is an historical book of the Old Testament. It describes the life of the Children of Israel under the rule of the judges, or deliverers, of the country. The judges ruled Palestine for many years after Joshua led the Israelites into this Promised Land.

The book tells of the rule of six judges in detail, and

briefly mentions six others. Some of these were but local figures. Others were obeyed through a large area. The book contains the wonderful Song of Deborah, the story of Gideon's army of 300 conquering the Midianites, and the account of Samson's great strength and his destruction of the temple of the Philistines.

The book of Judges is built up around a group of excellent old tales. The stories were probably told not long after the events they recount had actually happened. They were preserved for a long time by retelling, before being written. They are good records of what really happened. But many centuries later some philosophizing writer changed them for use in religious instruction. This writer in this way created the first philosophy of history. W.A.I.

See also DEBORAH; GIDEON; JOSHUA; SAMSON.

JUDGMENT, in law, is the decision of a court. The judgment may be a conclusion based upon evidence developed in the trial. A *judgment by default* is handed down by a court when the defendant does not appear to defend. A *confessed judgment* is given by the court when the defendant admits the claim against him.

A judgment becomes, at least for the time, the law governing the particular case before the court. But judgments are sometimes set aside or reversed by higher courts.

In some states and provinces, a judgment of money due becomes a *lien* upon the debtor's real estate. Elsewhere, an *execution* against the debtor's real estate is necessary before the plaintiff can collect the money owed to him. H.CAI.

See also DEBT; LIEN; STATUTE OF LIMITATIONS.

JUDGMENT in the broadest sense is the ability to weigh facts in order to reach a decision or a conclusion. The simplest form of judgment is *discrimination*. Discrimination is the process of arranging things into groups or classes. The process goes on at many different levels. Thus an ordinary person may look at a signed paper and say, "This is a contract." A trained lawyer may look at it and say, "You are mistaken. This is meant to be a contract, but it is not valid." Both these statements represent judgment. In a matter of this kind, we say that the lawyer has "better judgment" than the ordinary person, which means that he can discriminate more exactly between what is a contract and what is not. A two-year-old might pick up the same document, examine it for a few moments, and then say "Paper!" This would also constitute a judgment and an act of discrimination.

Philosophers used to think that objects actually *fell* into classes, so that judgment meant the ability to put objects in the classes to which they properly belonged. In modern times the view has developed that people simply make the classifications of objects, and that in many cases a different set of classifications would work quite as well as the one we now have. For example, we are accustomed to marking off the colors green, blue, and yellow. We feel that there really *are* such colors. But we know that the spectrum fades from red to violet so gradually that no one can draw a sharp line to show where one color stops and the next begins.

Anthropologists tell us that some tribes divide the spectrum from blue to yellow into two parts, one called "young leaf color," and one called "old leaf color." From our point of view, they are wrong in doing this, since they make no place for the color green. From their point of view, we confuse things by making up an extra color which does not exist. But we and they could agree that a nice judgment of color means the ability to classify colored objects correctly, according to whatever classes the group may have set up. When we have become accustomed for many years to grouping things in particular classes, the classes themselves are almost certain to seem as real to us as the things we are classifying.

In recent years there has been much discussion whether discrimination, either in animals or in human beings, is absolute or relative. For example, scientists have sometimes trained goldfish to choose their food from a particular one of three lighted compartments. If the compartments are illuminated to forty-five, thirty, and fifteen units of brightness, the fish can be taught always to go to the fifteen-unit compartment. No matter how the lights may be shifted around, the fish will always go to the compartment which is illuminated to fifteen units of brightness.

The old view assumed that the fish had learned to respond to brightness of a particular degree. But experiments have shown that a fish so trained, when faced with compartments illuminated to seventy-five, sixty, and forty-five degrees of brightness, unhesitatingly chooses the forty-five. This shows that the fish has learned, not a particular degree of brightness, but the *relationship*, and chooses the dimmest of the three. Many psychologists believe that all judgment is relative in this sense.

Emphasis upon the relativity of judgment is a contribution of Gestalt psychology. Behavioristic psychology takes the opposite view, and holds that judgments are absolute. R.H.WHE.

See also CONCEPT; PERCEPTION; PSYCHOLOGY; REASON.

JUDICIAL DEPARTMENT. See UNITED STATES CONSTITUTION (Article III).

JUDICIAL PROCEDURE. See COURT.

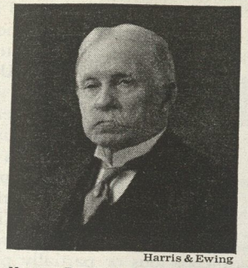
JUDICIARY ACT OF 1789. See COURT (Federal Courts); SUPREME COURT OF THE UNITED STATES.

JUDITH is the name of an Old Testament character. Her story is told in the Book of Judith, which is to be found in the Apocrypha of the King James version of the Bible. The Roman Catholic, or Douai, Bible includes the Book of Judith. Holofernes, an Assyrian captain, was persecuting the Jews. Judith went to Holofernes to plead for her people, and was allowed to enter because of her great beauty. She won his confidence, and on the third night, while he was sleeping, she cut off his head. See also APOCRYPHA; BIBLE.

JUDO. See JUJITSU.

JUDSON, HARRY PRATT (1849-1927), was the second president of the University of Chicago. He was an authority on politics and international law. Judson was born in Jamestown, N.Y., and was educated at Williams College. He began to teach, and came to the University of Chicago in 1892 as professor of political science. As dean of the faculties a year later, he worked closely with President William Rainey Harper in building up the school. The presidency of the university was given him in 1906 after President Harper died. He was retired in 1923 as president-emeritus.

See also CHICAGO, UNIVERSITY OF. E.W.KN.



Harris & Ewing

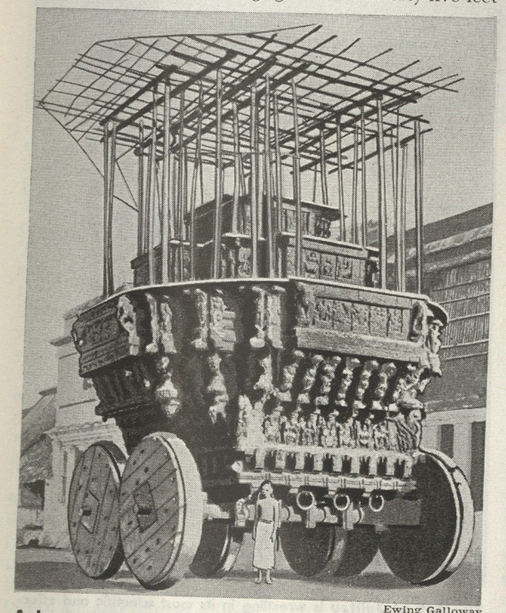
Harry Pratt Judson, American educator and historian

His Works. Judson was the author of a number of books on history and political science, including *Caesar's Army; Europe in the Nineteenth Century; The Growth of the American Nation; The Essentials of a Written Constitution; Higher Education as a Training for Business;* and *Young American.*

JUDSON COLLEGE is a liberal arts school for women at Marion, Ala. It is controlled by the Baptist Church. Students are offered courses in music, art, speech, and dramatics. Judson was founded in 1838 and has an average enrollment of about 180.

JUGGERNAUT, *JUG er nawt,* or **JAGANNATHA,** is the name of the most famous temple and idol of Hindustan. It is in the province of Orissa, India. *Juggernaut* is a Sanskrit word meaning *lord of the world.* The costly shrine was completed in the 1100's by Anantavarman Colaganga. The wooden idol has a hideous black face with a bloodred mouth. Its eyes are precious stones.

The idol rests on a throne between its brother Bala-Rama and its sister Subhadra. On festival days, the three are placed on separate cars and pulled through the streets. The car of the Jagannatha is forty-five feet high and has sixteen wheels. Many persons are needed to pull the heavy cars. Sometimes careless pilgrims are crushed to death beneath the wheels. It was once believed that these worshipers cast themselves in front of the cars on purpose. No such deliberate sacrifices have been made for the last two hundred years. Every year crowds of pilgrims worship at this shrine.



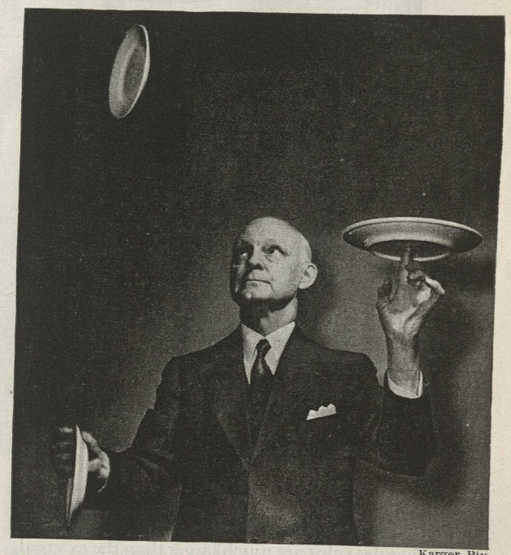
Ewing Galloway

A Juggernaut Car modeled after the Indian temple in Bengal, India. The idol of Hindustan was placed on a high tower on wheels on special days and drawn through the streets. Many persons threw themselves under the wheels and were killed. By this sacrifice, they thought they were sure of entering Heaven.

The word *Juggernaut* is commonly used to mean a heavy moving force, such as a railroad locomotive or a football fullback. G.N.MAY.

JUGGLER OF NOTRE DAME. See OPERA (Some of the Famous Operas).

JUGGLING is throwing objects into the air one after the other and catching them rapidly. It is most often done with balls, hoops, or tenpins, using from two to as many as ten or twelve objects at a time. Suppose the juggler has three tenpins. He throws them into the air one at a time until all three are in motion. As they fall back to the level of his hands, he catches them one by one and again throws them into the air. The process is repeated, and the juggler keeps throwing and catching the tenpins. Timing is very important in juggling. Any kind of objects may be used. Jugglers in vaudeville acts often use china plates, bottles, light bulbs, and other breakable objects.



Karger, Pix

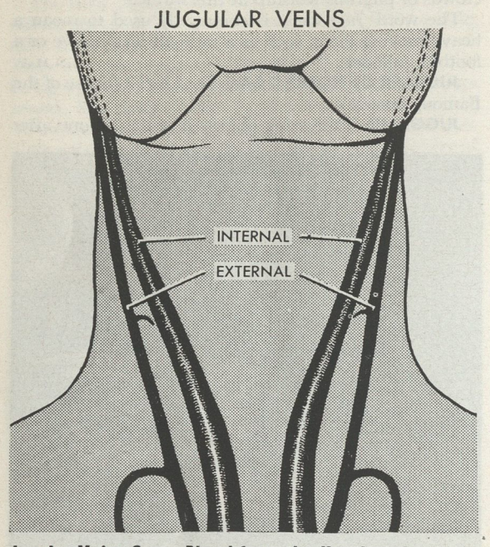
A Skillful Juggler Balances a Spinning Plate on his forefinger. With the other hand he keeps two more plates in the air, tossing and catching each in continuous motion.

Juggling also means any trick performed by the skill of the hand or eye. Balancing a stick or a knife on the nose is a form of juggling, and so is balancing two or three round balls on top of one another, or an egg on the end of a soda straw.

The word juggling is sometimes used to describe the action of a person who is trying to do something dishonest, especially with money. E.D.M.

JUGOSLAVIA, or **JUGO-SLAVIA.** See YUGOSLAVIA.

JUGULAR, *JUG yu lahr,* **VEIN,** is the name of each of four large veins which return blood to the heart from the head and neck. The veins get their name from the Latin word *jugulus,* which means *collarbone.* There are two jugular veins on each side of the neck, known as the *external* and *internal* jugulars. The external jugulars lie close to the surface and carry blood from the outside parts of the head and neck to the heart. The internal jugulars lie deeper and carry blood from the deeper tissues of the neck and from the interior of the skull. The internal jugular veins are much larger than the external, and are the ones commonly referred to. Cutting or otherwise opening an internal jugular vein usually proves fatal because of the rapid loss of blood. See also VEIN. N.S.D.,III.



Jugular Veins Carry Blood from the Head to the Heart

JUGURTHA (? -104 B.C.) was a prince of Numidia, the African country now known as Algeria. He was the grandson of Masinissa, who founded the empire. The prince was an expert horseman and warrior. He won and lost his country in a series of battles with the Romans and other African leaders. He was finally captured by Sulla and brought to Rome by Marius. Marius forced him to march in a triumphal parade, and then threw him into the Tullianum prison to die. The Jugurthine War was described by the Roman historian Sallust. See MARIUS, GAIUS. W.S.F.

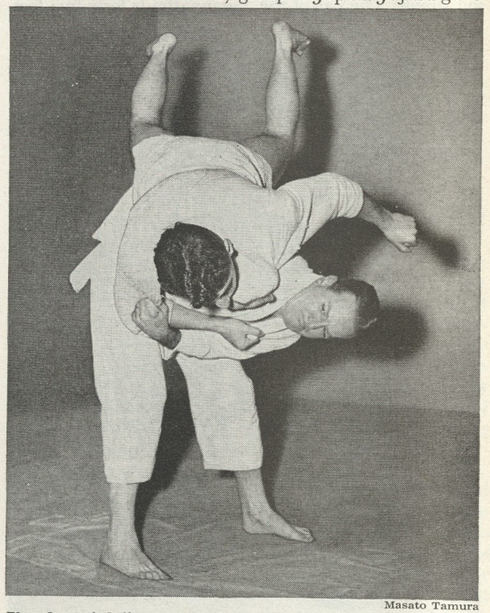
JUILLIARD MUSICAL FOUNDATION. See EDUCATIONAL FOUNDATIONS AND ENDOWMENTS; JUILLIARD SCHOOL OF MUSIC.

JUILLIARD SCHOOL OF MUSIC, in New York City, is a leading American music school. It was established under funds supplied by the Juilliard Musical Foundation which was created by Augustus D. Juilliard (1836-1919), a cotton merchant. He left his fortune for aiding the development of American music. The amount he gave is variously estimated at between $5,000,000 and $20,000,000. The school included the Juilliard Graduate School and the Institute of Musical Art.

JUJITSU, *joo JIT soo,* **JIUJUTSU,** or **JUDO,** is a Japanese sport somewhat like wrestling. Wrestlers depend more upon weight and strength. But the jujitsu expert depends upon skill and his knowledge of the human body. He knows the body's weak spots and strikes them to make his opponent helpless.

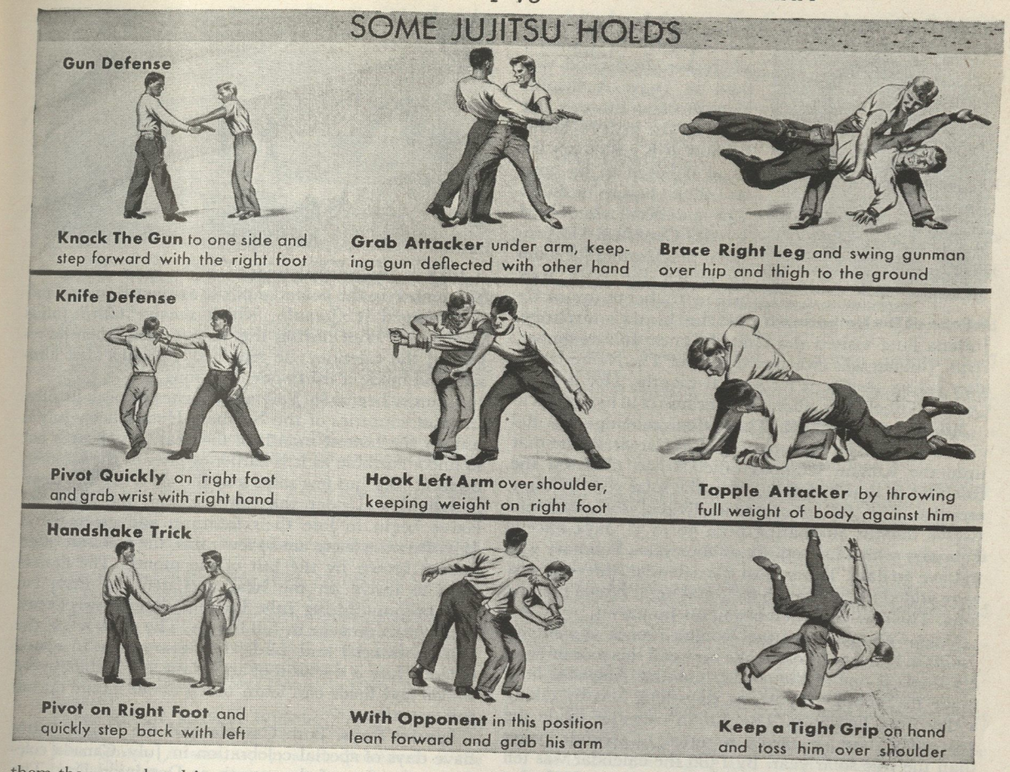
The jujitsu expert uses many wrestling holds. But he also uses holds forbidden in wrestling. Some of these holds will break an arm or leg or render the opponent unconscious or partially paralyzed. The blows of jujitsu may be given with the elbow or the stiffened fingers instead of the fist. The blows are aimed at some nerve center such as the solar plexus (behind the stomach), ankle, wrist, neck, or armpit. For example, a simple blow on the "funny bone" will temporarily disable a man so that he may be easily thrown to the ground. A jujitsu expert is also trained in methods of reviving patients, for often he must give first aid to his opponent.

Jujitsu has a long and honorable history among the Japanese. It probably existed some centuries before the Christian Era. Some accounts say that it was borrowed from Chinese monks. The unarmed monks had to develop this means of defense against the bandits. For centuries the secrets of jujitsu were carefully guarded by the rulers and the military group of Japan. Jujitsu gave them the upper hand in combat even when they were not armed. In recent years, however, most of its secrets have been released to the public.



Masato Tamura

The Art of Jujitsu is wrestling in its most scientific and effective form. The object is to throw an opponent to the ground so quickly that he is stunned. Then another hold is used to render the fallen victim helpless. Muscles, nerve centers, and other vital points must be studied by judo wrestlers. A judo expert can easily put an opponent's arm or leg out of joint, or even break it.



Judo is the popularized form of jujitsu. It is a scientific system based on certain exercises used in jujitsu. The system was first worked out and named by an instructor, Jiguro Kano of Tokyo. It is more easily taught than the old jujitsu. The judo used in the United States is practiced with the bare hands. There are other systems which use a short rope or a club. Their methods and results are similar to those of bare-hand judo.

Judo's main value is for self-defense, especially against a larger man. In fact, judo is based on the principle of using the opponent's greater strength and weight to his own disadvantage. Judo is not practiced as a competitive sport because of its dangerous holds.

The American judo system includes some of the kicking, gouging, and choking of old-time brawling. In wartime the training is known as judo, rough and tumble, or hand-to-hand combat. The serviceman is trained to use it either in close quarters fighting or as protection if he should be unarmed. Both civilian and military police are also trained in judo. E.D.M.

JUJUBE, *JOO joob,* **TREE.** See LOTUS.

JULIAN, *JOOL yan* (A.D. 331-363), was a Roman emperor who was called "the Apostate" because he tried to restore pagan worship. He was the nephew of Constantine the Great, and one of the few members of the royal family who escaped being massacred by Constantius II. He was allowed to go to Athens, where he studied philosophy and became a pagan.

He later took command of an army which defeated the Alamanni at Strassburg. Julian also forced the Franks to make peace. He was popular with his troops. They rebelled when Constantius tried to send Julian to the East, and proclaimed him emperor in 360. A year later Constantius died, and Julian took his throne in Constantinople. During his short reign he tried to restore paganism, but did not persecute the Christians. In the last year of his rule, Julian commanded an expedition against the Persians. Julian was killed in a battle in the desert beyond the city of Ctesiphon. W.S.F.

JULIANA, *joo lih AN ah* (1909-), is the ruler of The Netherlands. She was trained from early childhood to succeed her mother, Wilhelmina, as queen. As a young girl Princess Juliana attended classes at the palace with a few other girls of her own age. In her daily classes, she learned to cook, sew, and skate, just as the other girls did. Later she attended the University of Leiden, and received an honorary degree.

Juliana was made a member of the Council of State when she became of age on her eighteenth birthday. In 1937 she was married to Prince Bernhard of Lippe-Biesterfeld. During the German occupation of The

Netherlands (1940-1945), Juliana and her daughters lived quietly in Canada, where her third child was born in 1943. A ticklish legal problem arose at the time of the child's birth, because it is customary for royal children to be born on their home territory. The problem was solved by the Canadian Government proclaiming the room in which the birth took place to be temporarily Netherlands territory.

Karsh, British Combine

Juliana of The Netherlands

Juliana later visited the United States. In September, 1948, Juliana was crowned Queen of The Netherlands, after ruling as regent for several months. Her mother, Queen Wilhelmina, abdicated because of ill health. G.S.B.

JULIAN CALENDAR. The Julian calendar was devised in 46 B.C. by the order of Julius Caesar. Before that time the Roman religious officials had distorted the calendar so that it differed from the solar year by three months. The Julian calendar divided the year into twelve months alternating from 30 to 31 days, except February which had 29. Every four years February was to have 30 days. To readjust the calendar, three months were added to the year 46 B.C., making it fifteen months long. The new year then began on January 1.

Caesar also changed the Roman month *Quintilis* to *Julius* in honor of himself. We now call this month July. He made it one of the 31-day months. Augustus later made his month, August, 31 days long also by taking a day from February. The Julian calendar made the year $365\frac{1}{4}$ days, or eleven minutes, 14 seconds longer than the true solar year. By 1580 the calendar was ten days off. It was corrected by Pope Gregory XII. See also CALENDAR; GREGORIAN CALENDAR. P.So.

JULIAN PERIOD. See EPOCH.

JULIUS, *JOOL yus,* was the name of three Popes of the Roman Catholic Church.

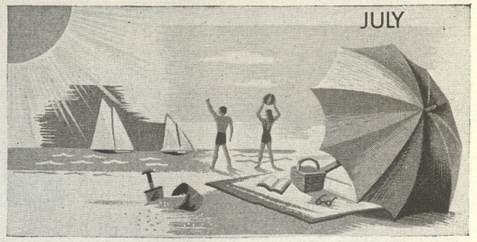
Julius I, Saint, was Pope from 337 to 352. He reigned during the period when the Church was divided over the Arian question. The followers of Arius, who denied that Christ was equal with the Father, preferred charges against Saint Athanasius. These the Pope dismissed. With the Emperor Constans, he called the Council of Sardica. His feast day is observed April 12.

Julius II (1443-1513) was Pope from 1503 to 1513. He was a great statesman and a liberal and wise patron of the fine arts, but he was not a great priest. He worked to restore Papal sovereignty and to remove foreign domination from Italy. He laid the cornerstone of Saint Peter's Church. He also formed the League of Cambrai in 1508 and the Holy League in 1512.

Julius III (1487-1555) was Pope from 1550 to 1555. While a cardinal, he was chosen one of the three legates to preside over the Council of Trent (see TRENT, COUNCIL OF). As Pope he reopened this Council in 1551. He also tried zealously to bring the English Church once more within the pale of Rome. The reconciliation effected by his legate, Cardinal Pole, did not last. F.J.S.

JULIUS CAESAR. See CAESAR, GAIUS JULIUS; SHAKESPEARE, WILLIAM (Synopses of Plays).

JULIUS ROSENWALD FUND. See ROSENWALD, JULIUS, FUND.



JULY is the seventh month of the year. It was the fifth month in the calendar of the ancient Romans, and they named it *Quintilis,* which means "fifth." Julius Caesar was born during this month, and when he reformed the calendar, he renamed Quintilis after himself, and made it thirty-one days long.

Summer begins in June and reaches its peak in July. In most countries of the Northern Hemisphere, July is usually the hottest month of the year. The heat is not so uncomfortable as it is earlier or later in the summer, because July has few rains and the air is dry and clear.

Activities. Under the burning sun, the grass and leaves begin to lose their freshness and greenness in July. Because there are so few rains, the fields are often burned brown by the last of the month. The flowers seem to thrive on the heat and many of them are most brilliant during July. Poppies, dahlias, sweet peas, and nasturtiums are in full bloom. The air is full of the hum of insects, and birds dart everywhere in search of food. July is a season of abundant life. A child in the woods and fields can learn much about nature during this month.

Special Days. Both Canada and the United States have days of special celebration in July. Canada celebrates the first of the month as Dominion Day. The British North America Act went into effect and Canada became a dominion on July 1, 1867. In the United States, July 4 is celebrated as Independence Day, when the Declaration of Independence was signed. There are picnics and speeches in the parks, parades, and other celebrations. The French celebrate July 14 as their independence day. They call it Bastille Day because the great prison in Paris, the Bastille, fell on July 14, and hundreds of prisoners were released. The Bastille had been the symbol of tyranny to the French. Three presidents of the United States died on July 4. They were Thomas Jefferson and John Adams, who both died in 1826, and James Monroe who died in 1831.

Symbols. The special flower for July is the water lily. The ruby is the July gem. G.HUM.

Related Subjects. The reader is also referred to:

Bastille	Independence Day
Bastille Day	Ruby
British North America Act	Summer
Calendar	Water Lily, or Pond Lily
Dominion Day	

Birthdays of Famous Persons

1. Jean Baptiste, Comte de Rochambeau, 1725, commander of French troops during the American Revolutionary War.
   Louis Bleriot, 1872, French aviator who first flew the English Channel in 1909.

2. Sir William Henry Bragg, 1862, English physicist.
   Christopher Willibald von Gluck, 1714, German composer.
3. Robert Adam, 1728, Scottish architect, furniture designer.
   Samuel de Champlain, 1567, French explorer and founder of Quebec.
   John Singleton Copley, 1738, American painter.
   Henry Grattan, 1746, Irish orator and statesman.
4. Calvin Coolidge, 1872, thirtieth President of the United States.
   Stephen C. Foster, 1826, American song writer.
   Guiseppe Garibaldi, 1807, Italian patriot and revolutionist.
   Nathaniel Hawthorne, 1804, American author.
   Joseph Pennell, 1857, American artist and author.
5. Phineas Taylor Barnum, 1810, American circus owner.
   David G. Farragut, 1801, Northern Admiral during the War between the States.
   Cecil John Rhodes, 1853, English statesman who developed South Africa.
   George Sand (Lucile A. D. Dudevant), 1804, French novelist.
   Sarah Kemble Siddons, 1755, English actress.
6. John Paul Jones, 1747, American naval hero of the Revolutionary War.
8. Jean de La Fontaine, 1621, French writer of fables.
   Ferdinand, Count von Zeppelin, 1838, German inventor of the dirigible.
9. Elias Howe, 1819, American sewing machine inventor.
   John D. Rockefeller, Sr., 1839, founder of Standard Oil and philanthropist.
   Nikola Tesla, 1856, American electrical inventor.
10. Sir William Blackstone, 1723, English lawyer, author of "Commentaries on the Laws of England."
    John Calvin, 1509, Protestant leader.
    Finley Peter Dunne (Mr. Dooley), 1867, American humorist.
    James Abbott McNeill Whistler, 1834, American painter.
11. John Quincy Adams, 1767, sixth President of the United States.
    Robert Bruce, 1274, King of Scotland who freed his country from the English.
    John Wanamaker, 1838, American merchant.
12. Julius Caesar, 100 B.C. Roman general, statesman, and author.
    George Eastman, 1854, inventor of the Kodak.
    Toyohiko Kagawa, 1888, Japanese social reformer.
    Sir William Osler, 1849, famous Canadian physician associated with Johns Hopkins University.
    Henry D. Thoreau, 1817, American author and naturalist.
    Josiah Wedgwood, 1730, English maker of fine pottery.
13. Sidney Webb, 1859, English economist and socialist.
    Mary Emma Woolley 1863, American educator.
14. Cardinal Mazarin, 1602, French cardinal and statesman.
15. Alfred Harmsworth, Viscount Northcliffe, 1865, British politician and newspaper publisher.
    Inigo Jones, 1573, English architect.
    Henry E. Manning, 1808, English cardinal.
    Clement Moore, 1779, American, author of "'Twas the Night Before Christmas."
    Rembrandt, 1607, Dutch painter and etcher.
16. Roald Amundsen, 1872, Norwegian explorer who discovered the South Pole.
    Mary Baker Eddy, 1821, American founder of Christian Science Church.
    Sir Joshua Reynolds, 1723, English portrait painter.
    Andrea del Sarto, 1486, Italian painter.
17. Isaac Watts, 1674, English hymn writer.
17. John Jacob Astor, 1763, German-American financier.
18. William Makepeace Thackeray, 1811, English author.
19. Samuel Colt, 1814, American inventor of the Colt revolver.
    Edgar Degas, 1834, French painter.
20. Francisco Petrarch, 1304, Italian poet.
    Alberto Santos-Dumont, 1873, Brazilian aviator and inventor.
22. Gregor Johann Mendel, 1822, Austrian botanist who discovered law of heredity.
24. Simón Bolívar, 1783, South American liberator.
    Alexandre Dumas, the Younger, 1824, French author.
    Amelia Earhart, 1898, American aviator, first woman to fly the Atlantic.
    Haile Selassie, 1891, Emperor of Ethiopia.
25. Arthur James Balfour, 1848, English statesman and philosopher.
    Thomas Eakins, 1844, American painter and sculptor.
    Maxfield Parrish, 1870, American painter and illustrator.
26. George Bernard Shaw, 1856, English playwright and critic.
27. Thomas Campbell, 1777, English poet.
    Alexandre Dumas, the Elder, 1802, French novelist.
28. Jean Baptiste Corot, 1796, French painter.
29. William Beebe, 1877, American naturalist and explorer.
    Benito Mussolini, 1883, Italian dictator and founder of Fascism.
    Booth Tarkington, 1869, American novelist.
    Alexis de Tocqueville, 1805, French statesman and author.
30. Henry Ford, 1863, American automobile manufacturer.
    Samuel Rogers, 1763, English poet.
    Giorgio Vasari, 1511, Italian historian of art.
    Thorsten Veblen, 1857, American social scientist and author.
31. John Ericsson, 1803, Swedish engineer and inventor of locomotive engine and steam-fire engine.

Notable Events in July

1. Battle of Gettysburg began, 1863.
   British North America Act went into effect, 1867.
2. President Garfield shot, 1881.
   San Juan Hill occupied by the Americans, 1898.
3. Battle of Gettysburg ended, 1863.
   Idaho admitted into the Union, 1890.
   Naval battle of Santiago, 1898.
   Quebec founded by Champlain, 1608.
4. Declaration of Independence signed, 1776.
   Vicksburg surrendered, 1863.
   Providence, R.I., founded by Roger Williams, 1636.
   Work began on Erie Canal, 1817.
   The Baltimore and Ohio, the first public railroad, started, 1828.
5. Venezuela declared its independence from Spain, 1811.
   William Booth founded Salvation Army, 1865.
6. John Huss burned at the stake, 1415.
   Republican party founded at Jackson, Mich., 1854.
7. Toussaint L'Ouverture proclaimed independence of Haiti, 1801.
9. Argentina declared her independence from Spain, 1816.
   General Braddock defeated near Fort Duquesne, 1755.
10. Wyoming admitted to the Union, 1890.
11. Alexander Hamilton mortally wounded in duel with Aaron Burr, 1804.
13. Ordinance of 1787 adopted.
14. Bastille prison in Paris seized and destroyed, 1789.

Howard Hughes established round-the-world speed record, 1938.
Matthew Perry opened Japan, 1853.
15. France declared war on Germany, 1870.
16. District of Columbia established, 1790.
17. Florida ceded by Spain to the United States, 1821.
First number of *Punch*, published in 1841.
18. Spanish Civil War began, 1936.
Allies began their offensive on Western front, 1918.
19. First Woman's Rights convention in United States met at Seneca Falls, N.Y., 1848.
20. Trial of Louis Riel began at Regina, Canada, 1885.
21. Belgium declared independence from Holland, 1831.
English fleet attacked the Spanish Armada, 1588.
First Battle of Bull Run, 1861.
24. British took Gibraltar, 1704.
Mormons reached Salt Lake, 1847.
25. Netherlands declared its independence from Spain, 1581.
Louis Bleriot made first flight across English Channel, 1908.
26. New York ratified the Constitution of the United States, 1788.
27. Laying of the Atlantic Cable completed, 1865.
28. Austria-Hungary declared war on Serbia, 1914.
Peru's independence from Spain proclaimed by General San Martin, 1821.
31. Columbus discovered island of Trinidad, 1498.

Quotations for July

Then came hot July, boiling like to fire,
That all his garments he had cast away. *Spenser.*

The summer looks out from her brazen tower,
Through the flashing bars of July. *Francis Thompson.*

If the first of July be rainy weather,
It will rain, more or less, for four weeks together.
English Proverbs. John Ray.

Hot July brings cooling showers,
Apricots and gillyflowers. *Sara Coleridge.*

JULY REVOLUTION. In July, 1830, the French people rose against their king, the tyrant Charles X. King Charles had tried to restrict the freedom of the press, and to make arbitrary changes in the laws regulating the right to vote. The July Revolution dethroned Charles, and established a constitutional system based on the power of the middle class, or *bourgeoisie*.

The crown was given to Louis Philippe, Duke of Orleans. Louis Philippe was a bourgeois king rather than an aristocratic king as Charles X had been. The lower house in the French legislature was given supreme power in the government, but it was elected only by those citizens who had high property qualifications. Great opposition arose against the July Monarchy, as Louis' reign was called. It was opposed by the workers who were left without the right to vote.

The influence of the July Revolution was felt throughout Europe. In The Netherlands, the Belgians revolted and declared themselves independent of Dutch rule.

As a memorial to the 651 citizens killed in the July Revolution, a pillar of bronze called the Column of July was erected in Paris. The pillar, made of bronze, stands on the site of the Bastille, famous in the French Revolution. (See BASTILLE.) The names of the dead are carved on the column, and their bodies are in the vaults below. Here lie also the bodies of those who fell in the later revolution of 1848. J.S.S.

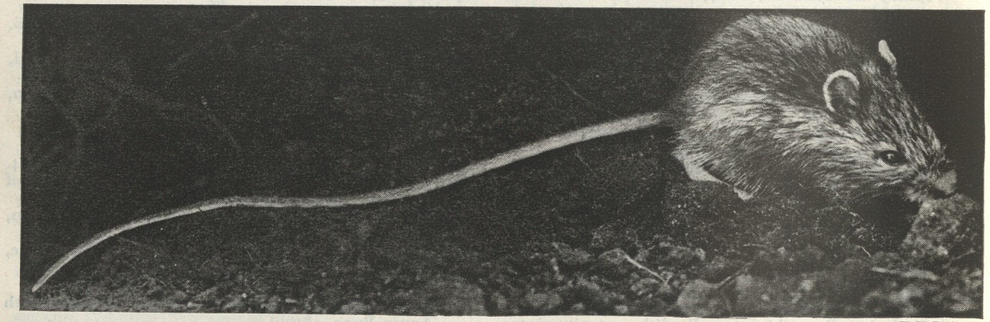
JUMBO. See BARNUM, PHINEAS TAYLOR; ELEPHANT (Superstitions about Elephants).

JUMNA, *JUM nah,* **RIVER,** in northern India, is one of the most important branches of the Ganges River. The Jumna rises in the Himalaya Mountains and flows southward for almost 900 miles. It empties into the Ganges at the city of Allahabad. Two canals, one leading westward from the Jumna and the other leading eastward, irrigate about 12,000 square miles of farm land in the river valley. G.B.CR.

JUMPING is a form of athletics which has been popular from very ancient times. The early Olympian games had jumping contests. Ancient Greek chronicles state that one Phayllus set a record of thirty feet, with the assistance of weights (*halteres*). These he carried in his hands and cast backwards when he began to spring.

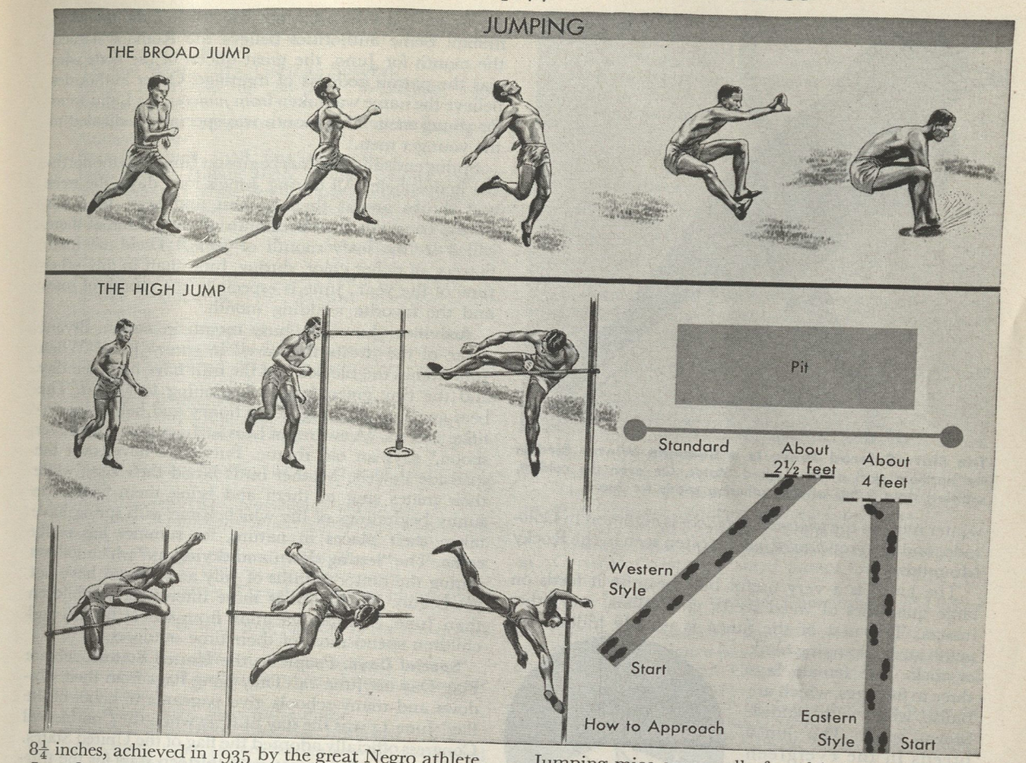
Today two forms of jumping are popular in public exhibitions of skill. These are the running high jump and the broad jump. The standing high and broad jump are not so popular in public exhibitions because they are less spectacular. Another event generally omitted from school athletics is the hop, step, and jump, either from a stand or from a run. The original scissors style of high jump has been replaced by what is known as the Eastern (Sweeney) style and the Western (roll) style. These two and their variations are taught by most successful athletic coaches.

The record for the running broad jump is 26 feet



H. H. Pittman

The Jumping Mouse Uses Its Extremely Long Tail to balance when it leaps. The mouse lives in nearly all parts of the United States, and in Canada as far north as the Arctic Circle. It lives in dense grasses and sleeps all winter.



$8\frac{1}{4}$ inches, achieved in 1935 by the great Negro athlete, Jesse Owens. The record for the running hop, step, and jump is 52 feet $5\frac{7}{8}$ inches, made by Naoto Tajima of Japan at the Olympic Games in Germany in 1936. The running high jump record is 6 feet 11 inches, made by Les Steers of California in the United States in 1941. See also POLE VAULT. E.D.M.

JUMPING BEAN. This bean gets its name because it jumps and rolls from side to side. Its movement is caused by the full-grown larva of a certain gypsy moth named *Carpocapsa saltitans*, which lives inside the bean. When the larva moves, the bean "jumps." Jumping beans belong to the spurge family and grow in Central and South America. They are somewhat three-cornered in shape. Americans call them *Mexican jumping beans*, and people in the Southwest sometimes call them *broncho beans* because of the way they jump. These beans have no value except as a novelty. L.A.SO.

Classification. Jumping beans belong to the *Euphorbiaceae* family.

JUMPING MOUSE is a name given to several field mice which hibernate in the winter. They are some of the most interesting mice that live in North America. The first record of the jumping mouse dates from the late 1800's. It was then called the "Long-legged Mouse of Hudson's Bay." Jumping mice are brownish colored with black specks. Their hind legs are longer than those of most mice, and they have long tails.

Jumping mice are usually found in meadows, dense fields, and thickets near the edges of woods. They particularly like to live in damp places. During the harvest season they may often be seen leaping like frogs, sometimes jumping ten feet at a leap. They remind one somewhat of kangaroos because of their long tails, which help them jump. If a jumping mouse loses its tail, or part of it, it cannot jump as well, and may lose its sense of balance.

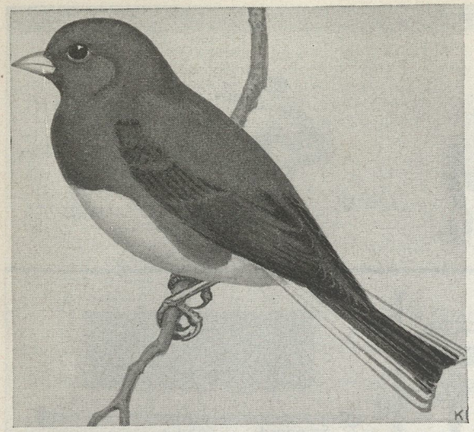
These mice live in most parts of North America from the Bering Sea in the far north, to North Carolina and New Mexico in the south. They are similar to the *jerboas* of Asia. S.P.Y.

See also DEER MOUSE; JERBOA; MOUSE.

Classification. Jumping mice belong to the family *Zapodidae*. The best-known jumping mouse is classed as *Zapus hudsonius*.

JUMPING SPIDER. See SPIDER.

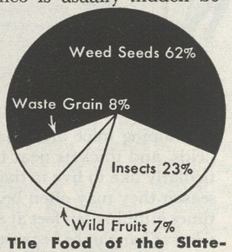
JUNCO, *JUNG koh,* is the name of a small bird which belongs to the finch family. The *slate-colored junco* is common in the eastern United States and Canada. It is found during the winter everywhere between New England and the Gulf of Mexico, but it returns to regions north of New England after April to nest. The slate-colored junco is about six and one half inches long. It has a slate gray back and breast, a white belly, and white outer tail feathers. The white outer tail feathers are very noticeable when the bird is flying. During the



The Slate-Colored Junco Is a Common Winter Bird in the northern part of the United States. On even the coldest, snowiest days it flits about gathering seeds for food.

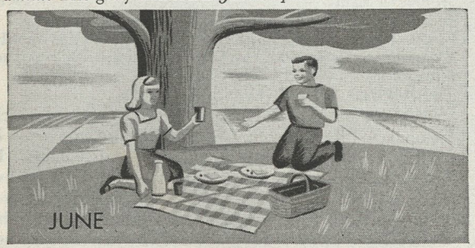
winter months the *white-winged junco* is common in Colorado, and the *gray-headed junco* is often seen in the Rocky Mountains.

The junco is a very useful bird because it feeds on large quantities of weed seeds, caterpillars, and other insects. The nest of the junco is usually hidden beneath an overhanging bank or rock. The female lays three to five eggs, which are bluish white with reddish brown spots. The junco breeds in the evergreen forests of the northern states and Canada. When cold weather approaches, however, juncos fly down from the north and gather in flocks in fields, hedges, and yards. They can be tempted to stay throughout the winter near a window shelf if given crumbs. See also FINCH. A.A.A. and L.A.HA.



The Food of the Slate-Colored Junco

Classification. Juncos make up the genus *Junco* in the family of the finches and sparrows, *Fringillidae*. The slate-colored junco is *J. hyemalis*. The white-winged is *J. aikeni*. The gray-headed is *J. caniceps*.



JUNE is the sixth month of the year. It was the fourth month in the early Roman calendar. It once had twenty-nine days, but when Julius Caesar reformed the calendar he gave it thirty. Caesar also made June the sixth month. Some authorities believe the Romans named the month for Juno, the great queen of the gods who was the patron goddess of marriage. Other authorities believe the name was taken from *juniores*, the Latin word for young men. This month was specially dedicated to the younger men.

Spring ends and summer begins on June 21 in the northern hemisphere. All during June's long days, the trees and shrubs are at their freshest and best. June has always been the favorite month of poets. One of them called it "the leafy month of June." There are more flowers, of richer color, during June than in any other time of the year. June is especially the month of roses and the favorite wedding month.

Activities. June is a busy month in nature. Bryant wrote of the "fruits that swell in sunny June." When June comes the blossoms of the fruit have had their day and the tiny green fruit is beginning to appear. The bees are busy carrying home honey and helping to fertilize flowers. "A swarm of bees in June is worth a silver spoon," says an old rhyme. Butterflies hover over the roadside flowers. Mother birds brood their eggs, while their mates sing to them and bring them food. The sunny beginnings of life which come with spring have taken their places in nature, for summer has really come. The "letting down and drying up" which follows during the hotter months of July and August have not yet begun. No month is more interesting to children than June. Summer vacation from school begins, and children spend most of their time outdoors.

Special Days. People in the United States celebrate Flag Day on June 14. They hang flags from their windows and many schools give pageants in honor of the flag. June 14 was the day in 1777 when the Continental Congress officially adopted the flag of the United States. At that time there were only thirteen stars for the thirteen original states. See FLAG.

Popular Beliefs. June has been a month for brides and marriages for hundreds of years. This tradition goes far back to early Roman history. In those days, the people believed that May was a very unlucky month for marriages. But June, especially the days when the moon was full, was believed to be better for marriages than any other time. This superstition remained all through the Middle Ages. June weddings are still a custom in many countries.

June Symbols. The special flower for June is the rose or the wild rose. The pearl is the June gem. G.HUM.

See also CALENDAR; FLAG DAY; PEARL; ROSE; SUMMER.

Birthdays of Famous Persons

1. Jacques Marquette, 1637, French missionary and explorer.
2. John Randolph of Roanoke, 1773, American statesman and orator.
   Thomas Hardy, 1840, English novelist and poet.
   Sir Edward Elgar, 1857, English composer and organist.
3. George V of England, 1865, British king during World War I.
4. George III of England, 1738, British king during the American Revolution.
5. Adam Smith, 1723, Scottish political economist who wrote *The Wealth of Nations*.

6. John Trumbull, 1756, American painter.
   Louis Antoine Godey, 1804, publisher of the famous *Godey's Lady's Book*.
   Thomas Mann, 1875, German novelist.
   Diego Rodriguez de Silva y Velásquez, 1599, Spanish painter.
   Nathan Hale, 1755, American patriot during Revolutionary War.
7. Beau Brummell, 1778, English dandy.
8. John Everett Millais, 1829, English painter, one of the originators of the Pre-Raphaelite movement.
   Robert Schumann, 1810, German composer.
   Frank Lloyd Wright, 1869, American architect.
9. John Howard Payne, 1791, American actor and playwright.
   Peter I of Russia, 1672, called Peter the Great.
   George Stephenson, 1781, English inventor of the locomotive.
11. John Constable, 1776, English landscape painter.
    Richard Strauss, 1864, German composer.
12. Charles Kingsley, 1819, English clergyman and novelist.
    Sir Oliver Lodge, 1851, English physicist.
13. Winfield Scott, 1786, American military leader.
    William Butler Yeats, 1865, Irish poet and playwright.
14. Harriet Beecher Stowe, 1811, author of *Uncle Tom's Cabin*.
15. Edvard Grieg, 1843, Norwegian composer.
    Ernestine Schumann-Heink, 1861, Austrian opera singer.
17. Charles François Gounod, 1818, French composer.
    Igor Stravinsky, 1882, Russian composer.
19. Blaise Pascal, 1623, French scientist, philosopher, and author.
21. Daniel Carter Beard, 1850, founder of the Boy Scouts of America.
    Rockwell Kent, 1882, American artist.
22. Anne Morrow Lindbergh, 1907, American aviator and author.
23. Carl Milles, 1875, Swedish sculptor.
    Irwin S. Cobb, 1876, American humorist.
24. John Cabot, 1450, Italian navigator who discovered the continent of North America for the English.
    John Churchill, Duke of Marlborough, 1650, English military leader against the French.
    Éleuthère Irénée Du Pont, 1771, founder of the famous Du Pont family.
    Henry Ward Beecher, 1813, American clergyman and abolitionist.
    Gustavus F. Swift, 1839, American meat packer.
26. William Thomson, Lord Kelvin, 1824, British physicist.
    Pearl S. Buck, 1892, American novelist, winner of Nobel prize.
27. Charles Stewart Parnell, 1846, Irish patriot and statesman.
    Paul Laurence Dunbar, 1872, American Negro poet.
    Helen Keller, 1880, American author and lecturer who learned to talk, although deaf and blind from infancy.
28. John Wesley, 1703, English founder of the Methodist Church.
    Henry VIII of England, 1491, second Tudor king.
    Jean Jacques Rousseau, 1712, French writer.
29. Peter Paul Rubens, 1577, Flemish painter.
    Henry M. Stanley, 1841, Welshman, noted African explorer.
    George W. Goethals, 1858, American engineer who built the Panama Canal.

Notable June Events

1. Kentucky admitted to the Union, 1792.
   Tennessee admitted to the Union, 1796.
3. De Soto took possession of Florida in name of Spain, 1539.
4. United States and Tripoli signed peace treaty, 1805.
5. First public balloon ascension took place in France, 1783.
   First installment of *Uncle Tom's Cabin* appeared, 1852.
6. World War II invasion of France began, 1944, "D Day."
7. Norway dissolved union with Sweden, 1905.
11. Committee appointed by Colonial Congress to draw up a Declaration of Independence, 1776.
13. First Canadian Parliament opened in Ottawa, 1841.
14. Stars and stripes flag adopted by United States, 1777.
    Hawaii organized as a United States territory, 1900.
    Capt. John Alcock and Lt. Arthur W. Brown made first transatlantic flight from America to Europe, 1919.
15. Magna Charta signed by King John of England, 1215.
    Benjamin Franklin proved that lightning was electricity by his kite experiment, 1752.
    Arkansas admitted to the Union, 1836.
17. Battle of Bunker Hill, 1775.
19. United States declared war on Great Britain, 1812.
    The Statue of Liberty received from France, 1885.
20. West Virginia admitted to the Union, 1863.
    Victoria became Queen of England, 1837.
    President announced purchase of Alaska, 1867.
21. Cyrus McCormick granted patent for reaping machine, 1834.
    New Hampshire ratified Constitution of United States, 1788.
22. Napoleon I abdicated, 1815.
23. William Penn signed peace treaty with Indians, 1683.
24. John and Sebastian Cabot reached the shores of North America, 1497.
25. General Custer killed by Indians in the battle of Little Big Horn, Montana, 1876.
26. Virginia ratified the United States Constitution, 1788.
    English corn laws repealed, 1846.
28. Archduke Francis Ferdinand of Austria and wife assassinated, touching off World War I, 1914.
    Treaty of Versailles signed, 1919.
29. Parliament authorized Canada to establish new provinces, 1871.
30. Indian Territory set aside for the Indians, 1834.

Quotations for June

And what is so rare as a day in June,
  Then, if ever, come perfect days;
Then Heaven tries earth if it be in tune,
  And over it softly her warm ear lays;
Whether we look or whether we listen,
  We hear life murmur, we see it glisten.
Lowell.

I knew that you were nearing, June, I knew that you were nearing—
I saw it in the bursting buds of roses in the clearing;
The roses in the clearing, June, were blushing pink and red,
For they had heard upon the hills the echo of your tread.
Douglas Mallock

No price is set on the lavish summer;
June may be had by the poorest comer.
Lowell

Then let us, one and all, be contented with our lot;
The June is here this morning, and the sun is shining hot;
Oh! let us fill our hearts up with the glory of the day,
And banish ev'ry doubt and care and sorrow far away.
James Whitcomb Riley.

Sawders

The Fine Deep Harbor at Juneau is one of the best in Alaska. The capital city of the territory is surrounded by forest-covered mountains. Each year great quantities of fish, furs, and lumber are shipped from this busy seaport.

JUNEAU, *JOO noh,* Alaska (population 5,818). The capital and largest city of Alaska lies on the upper mainland of the famed Inside Passage. It is one of the chief ports of the territory and the center of the gold-mining district of southeastern Alaska. Before 1944, the Alaska Juneau Gold Mine employed over 900 men and had an annual payroll of about $1,500,000. Because of high costs, the mine was closed after World War II. Fishing and lumbering are also important industries. Juneau is the headquarters for Federal and territorial government agencies. Transportation is by boat and by plane. The city is named after its founder, Joe Juneau, a prospector who discovered gold there in 1881. See also ALASKA (inset on colored map). A.J.D.

JUNEAU, SOLOMON LAURENT (1793-1856). See MILWAUKEE (History).

JUNE BEETLE. See INSECT (color plate, Beetles).

JUNE BUG, or **MAY BEETLE,** are names for several large brown beetles which are often seen in the United States during May and June. They are related to the ancient scarab beetles of Egypt, which were considered sacred. June bugs are usually seen at night when they are attracted by light. Great numbers of them fly about street lamps and many find their way into lighted rooms. Once indoors, they often bump awkwardly into furniture and other objects. They fall helplessly to the floor, kicking and struggling until they are right side up again.

June bugs eat the young leaves of trees and shrubs and often cause much damage. They deposit their eggs in the ground in meadows, gardens, and fields. The young larvae are large white grubs with brown heads. They burrow down into the soil in the fall and stay there two years or more. While the grubs are under the earth, they feed on the roots and tubers of strawberries, grains, grasses, and vegetables. Sometimes they cause great loss to farm crops. They come out of the ground in May or June as adult beetles, and fly about.

Many grubs may be killed by plowing deeply in the fall. This turns them up and exposes them to frost and to birds which eat insects. See also SCARAB. G.P.

Classification. June bugs belong to the genus *Phyllophaga* in the *Scarabaeidae* family. They are in the order *Coleoptera.*

JUNE GRASS. See BLUEGRASS.

JUNG, *yoong,* **CARL GUSTAV** (1875-), is a Swiss psychologist and psychiatrist who founded the school of analytical psychology. Some of his experiments and teachings form the basis of modern theories of how the human mind works. Jung invented the psychological expressions *introvert* and *extrovert.*

Jung was born in Basel, and studied medicine there. Later he became interested in psychiatry. He was at first influenced by the teachings of Sigmund Freud, but later developed his own theories. Jung lectured at the University of Zurich from 1905 to 1913, and became a professor at the Federal Polytechnic University, Zurich, in 1935. In 1943 he was named a professor at the University of Basel. F.E.C.

His Works include *Psychology of the Subconscious; Psychology of Dementia Praecox;* and *Studies in Word Association.*

JUNGFRAU, *YOONG frow,* is a famous mountain in the Bernese Alps of Switzerland. The name *Jungfrau* means *maiden,* or *virgin,* in the German language. Many tourists regard the Jungfrau as the most beautiful of all the Alps peaks. The mountain rises twelve miles south of the village of Interlaken, famous tourist resort.

The peak of the Jungfrau, which is 13,668 feet above sea level, was first climbed in 1811. Today an electric

railroad carries tourists 11,000 feet up the mountain, and the rest of the trip may be made in elevators. See also ALPS. W.R.McC.

JUNGLE. The thick forests of tropical regions are called jungles. They are so thickly overgrown with underbrush and smaller plants that one can hardly go through them. The natives sometimes must cut their way through with long knives. The largest jungles are in Central America, in the Amazon country of South America, in the East Indies, in southern Asia, and in the Congo region of Africa.

Life is very primitive in the jungle. The atmosphere is hot and damp and the natives wear few clothes. They often make their clothes from leaves and grass, or from the barks of trees. The natives hunt and fish for most of their food, and pick berries and fruit. The jungle is dangerous, for it contains many poisonous plants, as well as snakes and other wild animals. The natives live in thatched huts and often build a stockade of logs around each village to keep out wild animals and warriors from other tribes.

Jungles are the least civilized places on earth, except for the polar regions. But they often contain much wealth, such as the wild rubber in Brazil. For this reason, the white man has been invading the world's jungles for many years. W.C.BEA.

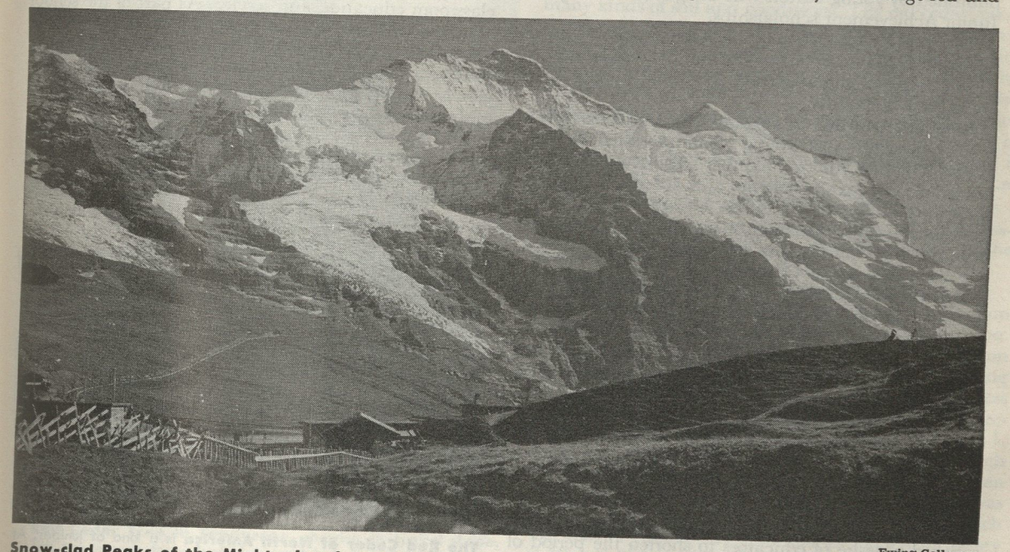
JUNGLE BOOKS. See KIPLING, RUDYARD.

JUNGLE FOWL is the name of a group of birds which are found in Southern Asia and the East Indies. They are the ancestors of our modern chickens. Jungle fowl are common in India. They run with great speed, fly rather high, and roost in trees. The hen's cackle is much like that of our domesticated fowls, but the cock crows like a bantam rooster.

Present-day domestic fowls are descended from the wild red jungle fowl. The red jungle fowl is found most commonly in mountain forests near small villages. It is particularly fond of bamboo thickets, but often enters a village to mingle with domesticated birds. Unlike domestic fowl, the male red jungle fowl takes only one hen for its mate. The males are very vicious fighters during the breeding season. They are orange-red and

Bureau of Animal Industry

The Female Jungle Fowl Has a Brown Color that blends with forest colors, and makes it easy for the bird to hide.



Ewing Galloway

Snow-clad Peaks of the Mighty Jungfrau tower over a green Swiss valley. Water from the melting snow and ice on its rugged side feeds the rapid brooks and streams that flow away from it. Jungfrau is famed for its majestic beauty.

shiny green in color. The females are a spotted brown, and often are hard to see. They hatch their eggs in a simple hole or hollow in the ground in the forest. J.J.H.

See also FOWL; POULTRY.

JUNGLE GARDEN, McKEE. See FLOWER (Garden Flowers [Famous Flower Gardens]).

JUNIATA COLLEGE is a coeducational liberal arts school at Huntingdon, Pa. It is supported by the Church of the Brethren. The college was founded in 1876. The name was changed in 1896. Normal enrollment is about 650. C.N.E.

JUNIOR ACHIEVEMENT, INC., is an organization which gives young persons practical training and experience in modern business methods. They form their own miniature corporations to make and sell a product or a service. The purpose of Junior Achievement is to provide business laboratories where students may learn how well economic theories work. Students between the ages of fifteen and twenty-one may take part in this work. Junior Achievement is sponsored and financed by business and industrial firms.

Junior Achievement functions in many cities in the United States. Community programs are conducted by local business, labor, and civic leaders. "Business centers," where students may organize and operate their own companies, are set up and supervised by small professional staffs.

Many miniature companies produce such items as radios, or leather, plastic, wood, and metal articles. Others publish newspapers or magazines, run banks, or produce radio and television shows.

Awards and scholarships are given to outstanding J.A. student businessmen by business and industrial organizations. The national *Achievement Magazine* is published by young editors who are going to college on Junior Achievement scholarships.

The Junior Achievement movement was begun in Springfield, Mass., in 1919. The founder was Horace A. Moses, a paper manufacturer. National headquarters are in New York City.

JUNIOR CHAMBER OF COMMERCE, UNITED STATES, is an organization of young men interested in civic affairs. The first Junior Chamber was organized in St. Louis, Mo., in 1915. There are now about 1,800 Junior Chambers of Commerce in the United States, with a total membership of about 180,000.Chapters also have been organized in Canada and many other countries. See also CHAMBER OF COMMERCE.

JUNIOR COLLEGE is a school which usually offers only the first two years of college education. The purpose of a junior college is to offer opportunities for both young and adult students to save time and money. Many jobs in the business and industrial world do not require a full college education for success, but these jobs do call for more than a high-school education. The junior college fills this need. There are more than 600 junior colleges in the United States. Most of them include the last two years of high school. A.GR.

JUNIOR HIGH SCHOOL. Junior high schools were established in rapidly increasing numbers after 1910. They satisfied a desire of educators to shorten the period of elementary schooling, in line with European practices. Most junior high schools include the seventh, eighth, and ninth grades. Some include only the seventh and eighth.

The junior high school has several functions. It continues the common education that all pupils must have. Pupils are guided into the fields for which they are best suited. They are taught what the major fields of learning are. With this knowledge, the pupil is prepared to select his high-school course, which should lead him to his career. Junior high school provides an easy step, or transition, from the personal guidance of the elementary school to the freedom and departmental system of the senior high school. H.G.G.

See also ELEMENTARY SCHOOL; HIGH SCHOOL.

JUNIOR LEAGUES OF AMERICA, INC., ASSOCIATION OF THE, is made up of more than 160 Junior Leagues in the United States, Canada, and Mexico. The 49,000 members of these Junior Leagues are young women who are interested in a program of good citizenship. They help their communities by doing volunteer social work of various kinds. They also support community projects in music, art, welfare, and other fields. The Association was founded in 1921 and has national headquarters in New York City.

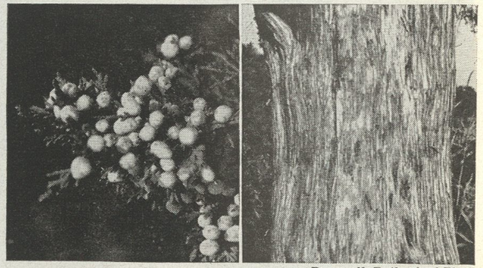
JUNIOR OPTIMIST CLUB. See OPTIMIST INTERNATIONAL.

JUNIOR RED CROSS, AMERICAN. Children in grade schools and high schools join the Red Cross through their home rooms or other school groups. The only requirement for joining is willingness to take part in the Red Cross program. The American Junior Red Cross has about 20,000,000 members. Its purposes include service to other people, health of mind and body, and world-wide friendship. The program offers instruction in first aid, water safety, accident prevention, and home nursing. The activities of the organization combine classroom education and service. As part of the school activities, children write to members of the Junior Red Cross throughout the world. They make and send gift packages overseas. Junior Red Cross groups work closely with senior chapters and follow Red Cross ideals and policies. See RED CROSS.

The American Junior Red Cross was founded in 1917 and has headquarters in Washington, D.C. E.A.RI.

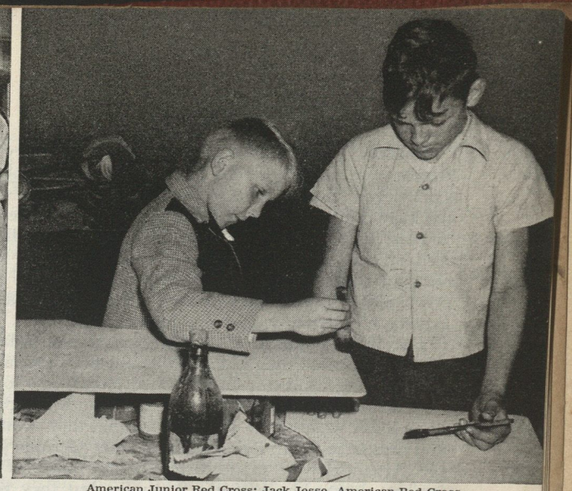
JUNIOR REPUBLIC. See GEORGE JUNIOR REPUBLIC.

JUNIPER is the common name of a group of evergreen trees and shrubs which belong to the cypress and cedar family. They are found throughout the Northern Hemisphere, except in tropical regions. All junipers have a fruit which is a cone, but which looks like a berry. It is a rounded, juicy fruit which varies in color from blue to red. The leaves look like scales or tiny spines.



Brownell; Rutherford Platt

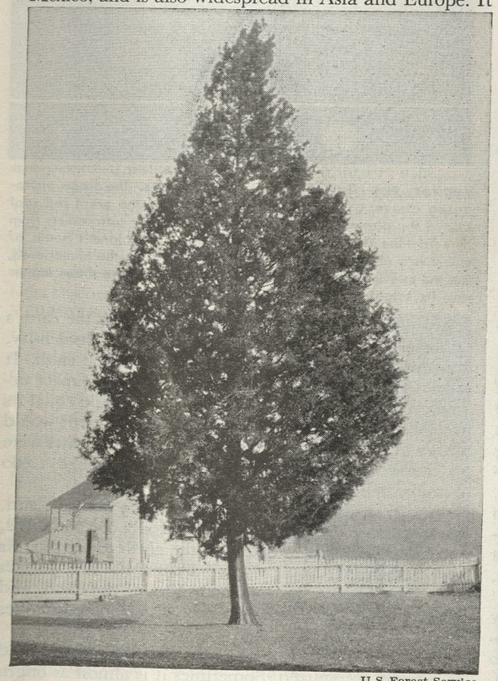
The Red Cedar of North America is a kind of juniper. At the left is a sprig of the foliage with its strong-flavored, berry-like fruits. At the right is a red cedar trunk.



American Junior Red Cross; Jack Jesse, American Red Cross

Boys and Girls of the Junior Red Cross perform many important services. At the left, a girl member of the organization is supervising children at a playground. At the right, boys are making lapboards for patients in veterans' hospitals.

The *common juniper* is probably more widely distributed than any other tree in the Northern Hemisphere. It is found in North America from the Arctic Circle to Mexico, and is also widespread in Asia and Europe. It grows most often as a shrub two to six feet tall, but may grow as tall as twenty-five feet. The sharp-pointed leaves of the common juniper have chalky white stripes on top and are dark, shiny yellowish green underneath. The bark is a deep chocolate brown tinged with red. The round, bluish-black fruits of the common juniper take two years to ripen. They contain an oil which is used in medicines and to flavor alcoholic drinks, especially gin. The wood of the common juniper is hard and fragrant. It is yellowish red and brown, and is frequently used for veneers.



U.S. Forest Service

Red Cedar Tree in Tennessee, showing its typical shape. This tree stands forty feet high, and is believed to be about thirty-five years old.

The *red cedar*, or *savin*, is another North American kind of juniper. Its leaves are usually scalelike, and its cones mature as fleshy fruits in about one year. Like the common juniper, it is widely distributed and grows in many kinds of soil and conditions. The red cedar sometimes grows to be 100 feet tall in the swamps and rich bottom lands of southern United States. The beautiful red heartwood of the red cedar is widely used in the manufacture of lead pencils and furniture. It is also used to make cedar chests for storing garments, since the odor of the wood keeps moths away. The wood of the red cedar does not decay under the ground, and is widely used for fence posts. J.T.B.

See also CEDAR; CONE-BEARING TREES.

Classification. The common juniper, *Juniperus communis*, and the red cedar, *J. virginiana*, belong to the family *Cupressaceae*.

JUNIPERO SERRA. See SERRA, JUNIPERO.

JUNIUS, *JOON yus*, **LETTERS** appeared in a London newspaper, the *Public Advertiser*, between 1769 and 1772. The sixty-nine letters, signed *Junius*, caused a sensation because of the attacks their author made on King George III and his ministers. One letter, the "Address to the King," published on December 19, 1769, reminded the king of the fate that had befallen Charles I.

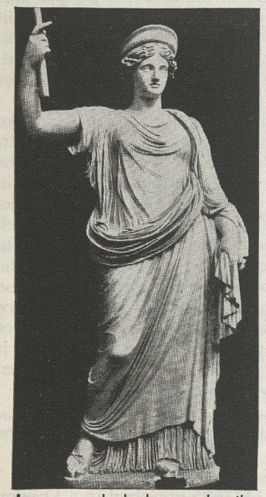
No one ever found out who Junius was, although many prominent men were accused of having written the letters. Historians now believe that their author was probably Sir Philip Francis. His handwriting was much like that of Junius. The publisher of the letters, Henry S. Woodfall, was prosecuted by the British Government, but he was acquitted. M.F.L.

JUNKER. The members of the landed aristocracy in Prussia were called Junkers. The law made the Junkers a privileged class until 1807-1808. Even after their special legal rights were taken away, they were all-powerful in Prussian public life. Most of the army officers, high civil officials, and diplomats were Junkers. After the German states were unified into a single nation, the power of the Junkers was extended throughout the land. Prussia led Germany, and the Junkers led Prussia.

The Junkers wanted high protective duties on farm products because they got their wealth from the land. The growing capitalist class wanted food prices to be lowered so that city-dwelling workers could live decently on lower wages. The Junkers got what they wanted, and thus forced high living costs upon the German people. Attempts were made to reduce the power of the Junkers during the Weimar Republic, but they were blocked by the influence of President von Hindenburg, himself a Junker. The Junkers greatly helped the Nazis in overthrowing the German Republic in 1933. J.S.S.

JUNKERS is a German airplane. See AIR FORCE (illustration, Military Planes Used During World War II); JET PROPULSION (Jets Put to Use).

JUNO was the leading goddess of Roman mythology, and was called Hera by the Greeks. She was queen of the gods and of heaven, and was the wife of Jupiter (Zeus).



Juno was looked upon by the Greeks as queen of the gods. This statue was found in the Villa Farnese in Rome.

Juno had many powers and duties. She was worshiped under the name of Juno Lucina as the bringer of light, and the goddess of beginnings. Other names given to her show that she was the goddess of marriage, childbirth, advice, money, and of all things that interested women. Her chief festival was called the *Matronalia* and was attended by both mothers and maidens.

Juno was jealous of Jupiter's love for mortal women, and spent most of her time planning punishments for his human wives and sons. The animals sacred to her were the goose, peacock, cuckoo, and serpent. In art she is shown as a beautiful mature woman. P.COL.

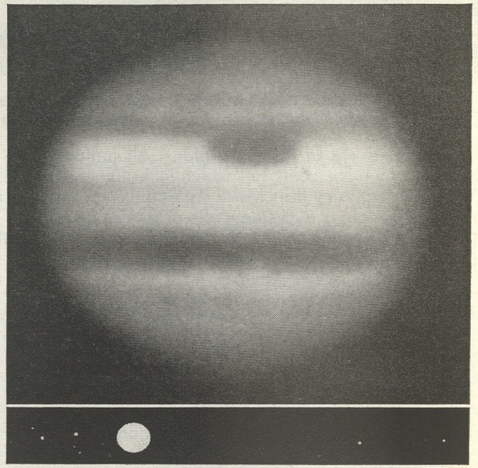
See also ARGUS; JUPITER; SEMELE; TROY; VULCAN.

JUNTA, *JUN tah,* or **JUNTO,** *JUN toh,* is an assembly or council, especially one which makes laws or administers them. The name *junta* has been chiefly applied to such assemblies in Spain and Spanish-American countries. An organization of the chief Whigs in England during the reigns of William and Mary and of Anne was known as the *Whig Junto.*

The interior committee, or the junto, of the Privy Council under Charles I served as the beginning of the modern cabinet system. Benjamin Franklin organized a debating society called the Junta. This developed into the American Philosophical Society in 1743. C.D.T.

See also CABINET.

JUPITER is the largest of the planets. Only the sun is larger than Jupiter among the bodies in the solar system. Jupiter's diameter averages 86,000 miles, or about eleven times that of the earth. Jupiter is not a perfect sphere. From pole to pole, its diameter measures 82,900 miles, while at the equator it is 88,700 miles.



E. C. Slipher, Lowell Observatory

Jupiter, the Greatest of the Planets. The large photograph above, taken in 1937, shows clearly the great red spot above the planet's center. It has been seen by astronomers from time to time during the last 150 years. The planet's bands of colors are also visible. What we see here is not the planet itself, but the swirling gases around it. The lower picture shows Jupiter and its brightest satellites.

Jupiter's surface is 130 times as great as the earth's surface, and its volume 1,300 times as great. Its density, however, is less than one-fourth that of the earth. It would take more than 1,300 earths to fill the space occupied by Jupiter, but only 317 earths would equal its weight. A man weighing 150 pounds on earth would weigh about 396 pounds on Jupiter. But if Jupiter were as dense as the earth, the man would weigh 1,500 pounds. See GRAVITATION.

Jupiter is the fifth planet in distance from the sun. Its average distance from the sun is 483,000,000 miles, or five times the distance from the earth to the sun. As the earth and Jupiter revolve around the sun, Jupiter may come within 367,000,000 miles of the earth, and at other times may be as far away as 600,000,000 miles from the earth.

Next to Venus, Jupiter is the brightest planet, and it is easily recognized. Sometimes it is almost as bright as Venus. When seen through an opera glass or telescope, Jupiter is distinctly flattened, because of the difference between its polar and equatorial diameters. The

planet is beautiful when seen through a large telescope. It has belts of different colors across it, which undergo a wide variety of changes from time to time. In 1878 a strange red spot, 30,000 miles long and 7,000 miles wide, was noticed on Jupiter. It remained for a few years, and then faded out for a time. Traces of it had been seen as early as 1665. The last time this startling spot was unusually red was in 1936.

Jupiter's day is less than half as long as our day. This planet turns on its axis once every nine hours and fifty-five minutes. It takes Jupiter almost twelve times as long to circle the sun, and its year is equal to almost twelve years on earth. Jupiter is tilted only slightly toward the plane of its orbit, and astronomers believe that its seasons do not change as much as seasons on the earth. See SEASON.

We do not see Jupiter's real surface. It is hidden by clouds of gas in violent motion. Measurement at the Lowell Observatory by W. W. Coblents and C. O. Lampland indicate that these clouds have a temperature of about −225°F.

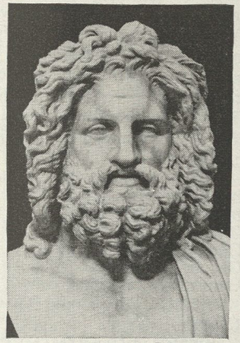
Jupiter's Satellites. Jupiter has twelve moons. Galileo discovered four of them in 1610. They were the first heavenly bodies discovered with a telescope. Astronomers have since learned that these four satellites always keep the same side toward Jupiter, as does the earth's moon. They spin once in the same time that it takes them to travel around Jupiter. Roemer made his great discovery of the velocity of light in 1675 by observing the eclipses of the satellites of Jupiter.

The fifth satellite was discovered by E. E. Barnard of the Lick Observatory in 1892, and the sixth and seventh were discovered in 1904 and 1905 by C. D. Perrine of the same institution. The eighth satellite was discovered in 1908 and the ninth in 1914. These two revolve around the planet in the opposite direction from the others.

In 1938 Seth Nicholson of Mount Wilson Observatory discovered two more satellites which have been numbered as the tenth and eleventh. He also discovered Jupiter's twelfth satellite in 1951. E.C.S.

See also ASTRONOMY; BARNARD, EDWARD E.; GALILEO (His Discoveries in Astronomy); PLANET; SATELLITE.

JUPITER was the king of the gods in Roman mythology. He was known to the Greeks as Zeus. Jupiter overthrew his father Saturn, and then divided the world with his two brothers. He gave control of the Lower World to Pluto, and control of the sea to Neptune. Jupiter himself kept the sky and ruled all the gods. He also had complete power over men.



Brown Bros.

Jupiter was the greatest Roman god, worshipped before the time of Christianity.

The first wife of Jupiter was Metis, the goddess of wisdom. A prophecy said that his first child would be wiser than its father. This alarmed him, and he swallowed Metis. But in a little while he had a headache and the goddess Minerva sprang from his forehead. She was fully grown and dressed in armor.

The second wife of Jupiter was Juno. She was a jealous goddess and made him very unhappy. He took many human wives to try to escape her nagging words, and married many other minor goddesses as well. He was the father of many gods and goddesses, among whom were Apollo, Diana, Mercury, Mars, Hebe, the Fates, and the Muses.

Jupiter had many powers and names. He was looked on as the god of lightning and the weather, and the protector of the interests of the state. Judges and generals took their oath of office by Jupiter. He was the god of destiny, and he upheld justice, virtue, and law.

In art Jupiter is represented as a handsome bearded man of middle age. An eagle is perched beside him, and he holds his mighty thunderbolts in his hand. P.COL.

See also ATLAS; EUROPA; and the various names of the gods mentioned.

JURA, *JOO rah,* is the name of a mountain range that lies between the Rhine and Rhone rivers. It forms part of the boundary between Switzerland and France. The Jura Mountains extend from the northeast to the southwest in parallel ridges for about 200 miles. The highest peaks of the Juras are less than 6,000 feet above sea level. Among these are Reculet (5,642 feet) in France, and Mount Tendre (5,518 feet) in Switzerland.

Valuable forests cover the sides of the mountains. Marble, alabaster, and granite are quarried. There are also deposits of iron, copper, and salt. Several beautiful lakes have been formed by the melting of glaciers on the lower slopes of the Juras. The most famous of these is Lake Geneva. Many rivers rise in the higher peaks, including the Doubs and the Ain. The city of Lausanne, Switzerland, lies on the southern slope of the mountains. W.R.McC.

See also SWITZERLAND (Physical Features).

JURASSIC, *joo RAS ik,* **PERIOD.** See GEOLOGY (Outline of Earth History).

JURISPRUDENCE is the science of law. See LAW.

JUROR. See JURY AND TRIAL BY JURY.

JURY AND TRIAL BY JURY. For hundreds of years, Englishmen and Americans have regarded the right to be tried by a jury of one's peers as an important guarantee of liberty. The Constitution of the United States provides that every person accused of a crime shall have the right to be tried by an impartial jury in the district where the crime was committed. The Constitution also guarantees the right of trial by jury in certain civil cases. Many European and South American countries have adopted the jury system. Some authorities consider the jury system an expensive and often faulty method for securing justice. But the jury still remains an important part of our legal system.

The history of the jury goes back to the 800's. The first juries were called *inquisitions.* They were used as a means of getting information and deciding the rights of the crown. This form of jury was brought to England by the Norman invaders. By the end of the 1400's, the jury had come to be used very much as it is used today. It took the place of such ways of deciding guilt or innocence as trial by combat and trial by ordeal.

Trial by Jury According to Common Law. The proce-

Ewing Galloway

Scene in a Courtroom during a Jury Trial. The twelve jurymen are sitting near the wall at the right. The judge is at the front of the courtroom, looking toward the witness who is testifying from the stand at the judge's left.

dure of trial by jury grew up as part of the English common law. From the beginning, the number of jurors was twelve. Jurors are sworn to try the issues well and render a true verdict. Then the trial begins. Witnesses are called by both sides, and the lawyers sum up their cases. If the facts are so plain there is nothing for the jury to decide, the judge may direct a verdict for the deserving party in a civil case or for a deserving defendant in a criminal case. He also explains to the jurors any points of law involved in the case, and tells them what questions of fact they must settle. The jury then leaves the courtroom to decide on its verdict. According to common law, the verdict must be unanimous. If the jurors cannot agree, there must be a new trial.

The nature of a jury trial has undergone many changes. Originally, jurymen were shut up without food and drink until they reached a verdict. Sometimes, if they failed to agree, they were carted to the edge of the county and thrown in a ditch. Today, no one except the other members of the jury can urge any juror to come to an agreement. Jurymen were once witnesses, called because they had knowledge of the facts. Now, special knowledge makes a person unfit for jury duty. In the United States, local and state law has modified the conduct of jury trials. The English system gives the judge who presides over the trial far more power than an American judge has. In some states, a five-sixths or lesser majority of the jury may decide a case.

Juries in Civil-Law Countries. The jury system was introduced into many countries of the European continent in the 1800's. But the juries followed the French, rather than the English, system. Under this system, the jury trial is used only in important civil cases, and in criminal trials. The verdict does not have to be unanimous, and there is no cross-examination of witnesses.

Grand Jury. The grand jury probably grew out of the Anglo-Saxon custom of having twelve senior thanes decide whether accused men should be freed or forced to submit to trial by ordeal or combat. The modern grand jury is made up of from twelve to twenty-three members. They decide whether or not there is sufficient evidence to hold an accused man for trial. If they decide there is, they vote a *true bill*, and the accused man is indicted. The jurors may rely on their own knowledge as well as that of witnesses, just as in Saxon days. Many experts believe that the grand jury has outlived its usefulness in the British legal system. In some of the American states, it is used only in special cases.

Petit, or Petty, Jury. The petit, or petty, jury is the ordinary jury. It weighs the evidence and decides questions of fact. In criminal cases it gives the verdict of *guilty, not guilty*, or, in Scotland, *not proven*. In civil cases the jury may decide the amount of damages to be paid. The petit jury ordinarily consists of twelve persons.

Coroner's Jury. The coroner's jury inquires into the causes of death in cases where there is doubt. It usually consists of six members. Like the grand jury, the coroner's jury may decide to hold a person on suspicion of murder.

Objections to the Jury System. The main objections to the jury system are that it is too expensive and too slow. At each session of court, a number of men are chosen in the manner prescribed by the law of the community. From these each jury is selected. Both sides may examine those selected for jury service to determine their fitness and may reject those they believe will be prejudiced. In the United States, this right of challenge is carried to extremes and wastes a great deal of time. Another objection to the jury system is that, in certain types of cases, pressure may be brought on members of the jury and they may fear to bring in a just verdict. In general, however, trial by jury remains an important right of democratic peoples. But the right to trial by jury is voluntarily given up in an increasing number of cases.

H. CAI.

Related Subjects. The reader is also referred to:

Bailiff	Crime
Bill of Rights	Indictment
Civil Law	Judge
Common Law	Law (with list)
Coroner	Thane
Court (Judicial Procedure)	Trial by Combat

JUSTICE. See JUDGE; LAW; SUPREME COURT OF THE UNITED STATES.

JUSTICE, DEPARTMENT OF. Most countries have departments of justice, though they may call them by other names. The main job of such a department is to take charge of the legal business of the government. The Department of Justice of the United States enforces

Federal laws through legal action, furnishes legal advice in all Federal law cases, and interprets the laws under which all the other government departments act. It conducts Supreme Court cases which concern the government. (See also SUPREME COURT OF THE UNITED STATES.) The Department of Justice also has charge of Federal prisons. It investigates violations of Federal laws and watches over national security, in war and peace. Its attorneys represent the Federal Government in the courts.

The United States Department of Justice was established by act of Congress in 1870. At the same time, the new department was placed under the authority of the Attorney General.

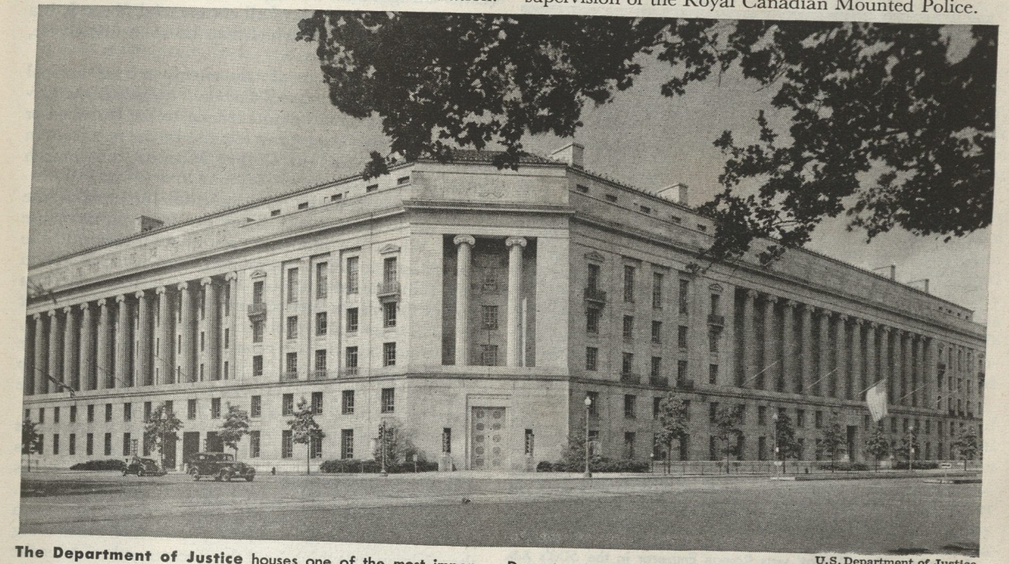
The Attorney General. When the Federal Government was organized in 1789, Congress provided that the Attorney General should be a member of the President's Cabinet. His duties were to give the President legal advice and to argue cases before the Supreme Court. His salary was $1,500 a year, and out of it he was supposed to pay the salary of an assistant. At first the duties of the Attorney General took up little of his time. He did not even have to live in Washington. By the 1850's, however, the duties had increased to the point where the Attorney General had to give all his time to them.

The Attorney General is appointed by the President. He is the chief law officer of the United States. He represents the United States in legal matters and gives legal advice to the President and to heads of government departments. The Attorney General has supervision over the divisions of his department and over United States attorneys and marshals. The work of the department has grown so complex that much of the Attorney General's time is taken up with the work of administration. But he still argues the government's case in Supreme Court actions of great importance. The salary of the Attorney General has increased to $15,000 a year.

Solicitor General. The office of the Solicitor General was created at the same time as the Department of Justice. The Solicitor General is responsible for conducting government cases before the Supreme Court. He also decides whether or not Federal cases are to be appealed to higher courts.

Divisions of the Department. The work of the Department is carried on through several divisions and bureaus. The *Antitrust Division* enforces antitrust laws by court action. The *Tax Division* carries on lawsuits in connection with internal revenue laws. The *Claims Division* has charge of claims against the Federal Government. The *Lands Division* handles legal matters in connection with Federal property. The *Criminal Division* takes charge of Federal prosecution of criminal cases. The *Customs Division* handles cases which have to do with the valuation of imported goods. The *War Division* was created in 1942 to handle war matters, especially questions relating to enemy aliens. The Department of Justice also has several bureaus, including the *Federal Bureau of Investigation* and the *Bureau of Prisons*. The *Immigration and Naturalization Service* was moved from the Department of Labor to the Department of Justice in 1940.

Canada. In Canada, the Minister of Justice (who is also Attorney General) and the Solicitor General both serve in the Ministry, or cabinet. The Canadian Department of Justice administers justice in Canada and gives legal advice to the heads of all government departments. It also reviews laws passed by Parliament, and has supervision of the Royal Canadian Mounted Police.



U.S. Department of Justice

The Department of Justice houses one of the most important branches of the United States Government. Here, cases in Federal law are studied by skilled lawyers. Lawyers from the Department represent the Government when the cases are tried in court. One of the well-known bureaus of the Department is the Federal Bureau of Investigation, or the FBI.

The department also administers the prisons and the Canadian secret service. P.S.W.,JR.

See also CANADA, GOVERNMENT OF; FEDERAL BUREAU OF INVESTIGATION.

JUSTICE OF THE PEACE is an officer of a township or county or other unit of government who has certain judicial powers. His duty is to prevent breaches of the peace and to bring offenders against minor laws to punishment. He has judicial power only in certain petty civil cases. Offenders are brought before the justice of the peace after they are arrested. The justice of the peace either discharges them or sets bail. In cases where the offender cannot furnish bail, he is sent to jail. In some states, the justice of the peace acts only as the magistrate who holds the accused person for action by the grand jury.

Justices of the peace are appointed by the governor in some states. In other states, they are elected by the people. In large cities, police magistrates act as justices of the peace. H.CAI.

See also COURT; NOTARY PUBLIC.

JUSTIN II (d. 578). See BYZANTINE EMPIRE.

JUSTINIAN I, *jus TIN ih an* (A.D. 483-565), called "the Great." Barbaric tribes of central Europe had conquered most of the western Roman Empire in the 400's. In 518, Justin I, an illiterate Illyrian peasant, became emperor of the eastern empire. He gave a share of his power to his nephew in 527. When he died a few months later, the nephew became Emperor Justinian I.

Justinian spent more than twenty years in driving the Vandals, Huns, and Franks from Italy and North Africa. He restored most of the empire to Roman control. But his work of most lasting importance was to gather together Roman law into one code. The result was the *Corpus Juris Civilis*, or *Body of Civil Law*. This legal code became the foundation of law in most western European countries.

Brown Bros.

Justinian the Great was Roman Emperor in the 500's A.D. He directed ten scholars to organize all the Roman laws into one code. This code of law became one of the greatest Roman contributions to European civilization.

Justinian was a Christian, and tried to unify the Roman Empire in a single Christain faith. He made war on heretics, particularly the Arians. He also closed the Athenian schools of philosophy in 529 because he believed that they taught paganism. Justinian was famed as a builder. He erected many fortresses, harbors, and monasteries. He also had the Church of Santa Sophia built at Constantinople. The people had to pay heavy taxes for his wars and his building program. W.S.F.

JUSTINIAN CODE. Justinian I, ruler of the eastern Roman Empire from 527 to 565, commanded ten of the wisest men in his realm to draw up a collection of the Roman laws. This collection is known as the Justinian Code. It is also called the *Corpus Juris Civilis*, which means *Body of Civil Law*. The Code is recognized as one of the greatest Roman contributions to civilization. It was a compilation of early Roman laws and legal principles, illustrated by cases, and combined with an explanation of new laws and future legislation to be put into effect. It clarified the laws of those times, and has since served as a basis for the law codes of many countries.

The scholars who compiled the Justinian Code divided it into four parts. The *Institutes* served as a textbook in law for students and lawyers, the *Digest* was a casebook covering many trials and decisions, the *Codex* was a collection of statutes and principles, and the *Novels* were various proposed new laws. S.T.K.

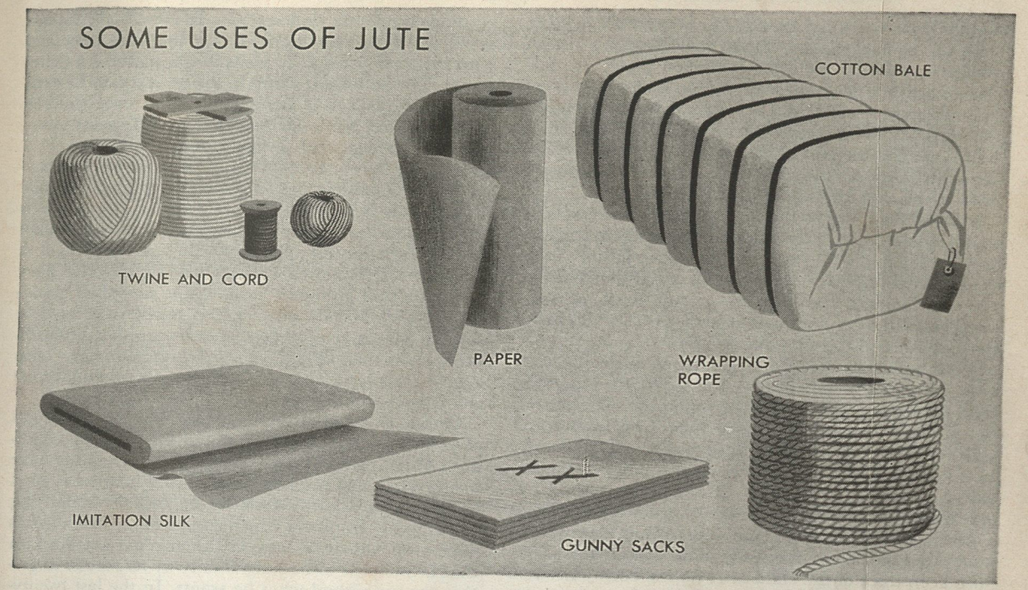
JUSTO, AUGUSTÍN P. (1876-1943). See ARGENTINA (Later Struggles for Power).

JUTE is the cheapest of all commercial fibers. It is a long, soft, shiny fiber which can be spun into coarse, strong threads.

Jute is the product of two closely related tropical plants which scientists call *Corchorus capsularis* and *Corchorus olitorius*. These plants belong to the basswood or *Tilaceae* family. They grow chiefly in the northeastern part of India, and in China, Formosa, and French Hindustan.

To grow jute, natives simply scatter, or *broadcast*, the seeds on well-tilled soil. They do not even cover the seeds. When the plants are about six inches tall, the natives loosen the earth around them with a rake. Then they thin the plants out. Weeds are removed from around the plants only twice before it is time to harvest the jute. Jute stalks grow seven to fourteen feet high, and do not branch except at the top. Usually they are harvested after they bloom, but before the blossoms go to seed. The best fiber is obtained when the plants are harvested immediately after they bloom.

The natives harvest the jute by cutting off the stalks close to the ground. Then they strip the stalks of leaves and blossoms and tie them in bundles. These bundles are soaked in water until the outer bark begins to rot. Jute makers call this process *retting*. Retting takes from five to ten days. It loosens the jute fibers by dissolving the sticky gums which hold the fibers together. After the fibers are loosened, the natives wade into the pools of water and beat the mass of fiber with clubs. This separates the fibers. They are then stripped from the stalks and rinsed by being swished in the water. Finally the fibers are hung up to dry. Jute is graded in quality according to its color, its strength, and the length of the fibers. Then it is pressed into bales which weigh about four hundred pounds each, and shipped to manufacturers.



Jute is most often used to wrap bales of raw cotton and to make gunny sacks and gunny cloth. The fibers are also woven into coarse curtains, chair coverings, carpets, and burlap. Very fine threads of jute are sometimes made into imitation silk. The fibers are used alone or blended with other fibers to make twine, cordage, and rope. Jute butts, which are the coarse ends of the plants, are sometimes used to make cheap grades of cloth. Bombay hemp is a fiber like jute which is used for similar purposes. M.S.R.

See also BURLAP.

JUTE. The people of an early Teutonic tribe from Denmark were called Jutes. They assisted the Angles and Saxons in conquering the island of Britain during the A.D. 400's. According to the Anglo-Saxon Chronicle, the first Jutes who landed on the island (A.D. 449) were led by Hengist and Horsa. The Angles, Saxons, and Jutes conquered all the country except the western part, which is now Wales. Many Britons fled into Wales to escape the invaders. The name Jute is still preserved in the word Jutland (Northern Denmark). See also ANGLO-SAXON. J.S.S.

This Boat, Once Used by the Jutes, is preserved in a Danish Museum. The Jutes were skilled and brave seamen.

JUTLAND. See DENMARK.

JUTLAND, BATTLE OF, was the greatest naval engagement of World War I. The German fleet met the British fleet off the entrance to the Skagerrak on May 31, 1916. Both the British and the Germans suffered great losses of men and ships. The Germans withdrew from the battle and announced that they had won a victory, but the British remained the masters of the sea.

JUVENAL, *JOO vee nal* (A.D. 60?-140?), was a poet and satirist of Rome. As a young man, he became an effective orator. He began writing satires after Trajan became emperor in A.D. 98. Juvenal bitterly disliked conditions in Rome, and his first nine satires violently attacked those features of Roman life which roused his anger. The last seven satires were less violent. Juvenal's judgment of his time was very one-sided. He never mentioned the great and wise people of his time, or the good features of Roman life.

William Gifford and John Dryden translated some of the satires into English, and Samuel Johnson imitated two of them in his *London* and the *Vanity of Human Wishes*. C.H.O.

JUVENILE, *JOO vee nil,* **COURT** is a special court where cases involving children are handled. Not many years ago, a child could be sent to prison for stealing a loaf of bread. Children had no legal rights to manage their own property, but when they broke the law, they were considered fully responsible adults. They were

tried for lawbreaking in regular courts and sentenced to terms in regular prisons. There they associated with murderers, thieves, and other hardened criminals. The modern attitude toward children who break laws is entirely different. Every effort is made to solve the child's problems before he comes to court. The juvenile court itself is not considered a place where an offender is punished. Its purpose is to give help and guidance to the child by placing him under its guardianship.

Most of the cities of the United States have special courts for children. These courts vary greatly in the way they are set up and in the procedures they follow. Some cities have set up juvenile courts as departments of the court of domestic relations, the circuit court, or other branches of the regular court system. Other cities make the juvenile court a separate division.

Juvenile courts also differ greatly in their effectiveness. The choice of a person well suited for the judgeship is an important factor in determining the effectiveness of a juvenile court. Men and women who understand children and who are both wise and kindly make the best judges. Many cities have woman judges who preside over special girls' courts. The most successful juvenile courts have large staffs of trained workers. These workers investigate each case and consult psychiatrists and other specialists about the child in question. They also keep track of the child after he has been placed on probation. No probation system is effective unless it includes enough good probation workers to permit the careful checking and observation of each case.

Hearings in a juvenile court are quite different from the proceedings in a regular court. There are no spectators. The judge talks informally to the child, his parents, and the court workers. Each case is studied as a separate problem. When the child's home is the source of his trouble, he may be placed in a foster home where the court workers watch over his progress. The child is sent to a training school only when all other measures have failed. Such schools are like educational institutions rather than prisons.

History. The effort to get better treatment for child lawbreakers was part of the reform movement of the late 1800's. Massachusetts was the first state to pass laws providing separate trials for children. The first children's courts were founded in Adelaide, South Australia, and in Toronto, Canada. The first juvenile court in the United States was established in Chicago in 1899. Denver set up a juvenile court in 1903. This court became famous because of the outstanding personality of its judge, Benjamin B. Lindsey. Most American cities set up juvenile courts during the early 1900's. European countries also established juvenile courts as part of their regular court systems. H.Cai.

See also Juvenile Delinquency; Lindsey, Benjamin Barr.

JUVENILE DELINQUENCY. A child who breaks a law is a juvenile delinquent, not a criminal. In the United States, he is tried in special courts where every effort is made to help keep him from breaking more laws, rather than to punish him for his crime. But not all juvenile delinquents are young criminals.

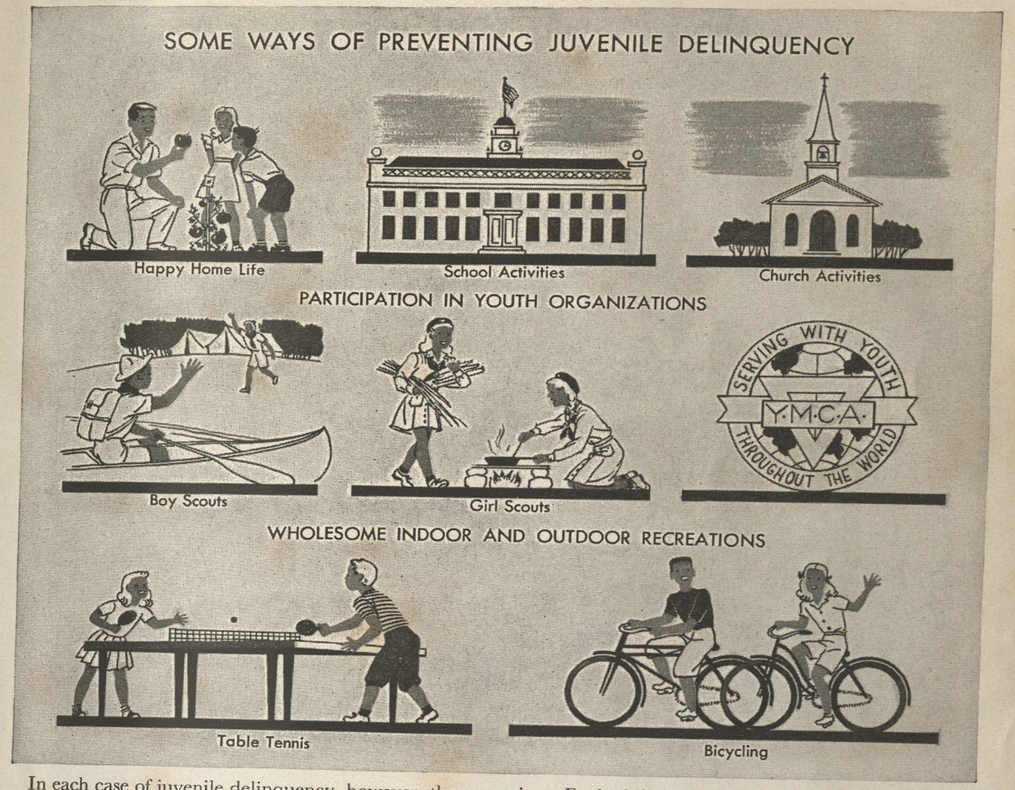
Almost any kind of action or behavior on the part of a child which endangers his own well-being may be considered juvenile delinquency. In New York, the law says that a child who begs for money in public, associates with immoral persons, or visits illegal places is a delinquent. The definition varies in different states. In some states juvenile courts have jurisdiction over children only until they reach the age of sixteen. In most states, however, the age limit is eighteen.

Juvenile delinquency is an important problem for law-enforcement officers and for society in general. Juvenile delinquency is increasing faster than the population is growing in size. It is increasing faster among girls than among boys. Young people find themselves living in a world in which standards are changing quickly. They no longer find guidance in the same way their grandparents did. Social agencies and people interested in helping young people face an ever-growing problem. Methods of handling juvenile delinquents have been greatly improved since the early 1900's, when juvenile courts were first set up.

Causes of Juvenile Delinquency. The general causes of juvenile delinquency are found in the social conditions of the time. Certain trends in American life have made youth feel insecure, and unsure of what is good conduct and what is bad. One of these underlying causes is the emphasis which American civilization has placed on money values. Children often get the idea that behavior is to be judged only by its success in getting the individual what he wants. In the last twenty-five years, the home and family life have become much less important to young and old alike. Often parents are divorced and remarried. The automobile provides new freedom of movement. The motion picture, radio, and comic strip stress the romantic thrills of excitement and crime. Many children no longer learn moral values either at home or at church. Children reflect the loss of standards and sense of insecurity that they feel in their parents and in other adults.

Ewing Galloway

The Juvenile Delinquency Court was started with the idea that "an ounce of prevention is worth a pound of cure." The court often works in connection with social agencies and mental clinics. Their combined efforts try to correct, rather than punish, a youthful offender. Investigation has proved that many criminals started their lives of crime as children. Juvenile delinquency courts afford the state an opportunity to help offenders during their formative years so that they may later become law-abiding and worth-while citizens.



In each case of juvenile delinquency, however, there are definite causes. It is not easy to say just why certain children become problems and others grow up as so-called sane and normal individuals. Every case can be traced to a lack of adjustment between the child and society. Sometimes there is a basic weakness in the child himself. As a rule, this weakness shows up because of trouble in the child's surroundings. These surroundings include the home, the family, and the neighborhood.

Treatment. The juvenile court was the first step in the important direction of handling youthful lawbreakers as children who needed care and protection, rather than as criminals who should be punished. Many new methods of protection and correction have been developed in connection with the juvenile court and with social agencies which care for children. The probation system has made it possible to watch over the child without taking him away from his home. Mental clinics have led to a better understanding of children's problems. Government studies have thrown light on the whole question of juvenile delinquency. Even the modern reform school, to which the child is sent only after other methods have failed, is a far less harmful place than prison. Each child who comes before the juvenile court is handled as an individual problem, and each case is studied in the same way that a physician studies a patient. The consulting psychiatrist analyzes the child's mental life. The probation officer studies the history and surroundings of the child. The social workers of the juvenile courts and of other social agencies try to give the child a more normal life.

At present many agencies and organizations are trying to prevent juvenile delinquency before it occurs. Special stress is being placed on providing playgrounds and programs of recreation for youth. Youth organizations such as Boy Scouts and the Girl Scouts have camps where children can spend their vacations. Y.M.C.A. and Y.W.C.A. groups provide athletic opportunities, recreational programs, and club and handicraft activities. More and more, those who are concerned with juvenile delinquency have come to realize that it can be prevented only when every child is given a full opportunity to lead a happy, contented, healthy, and useful life. E.S.B.

See also Character Education (with list); Child; Family; Juvenile Court; Reformatory.